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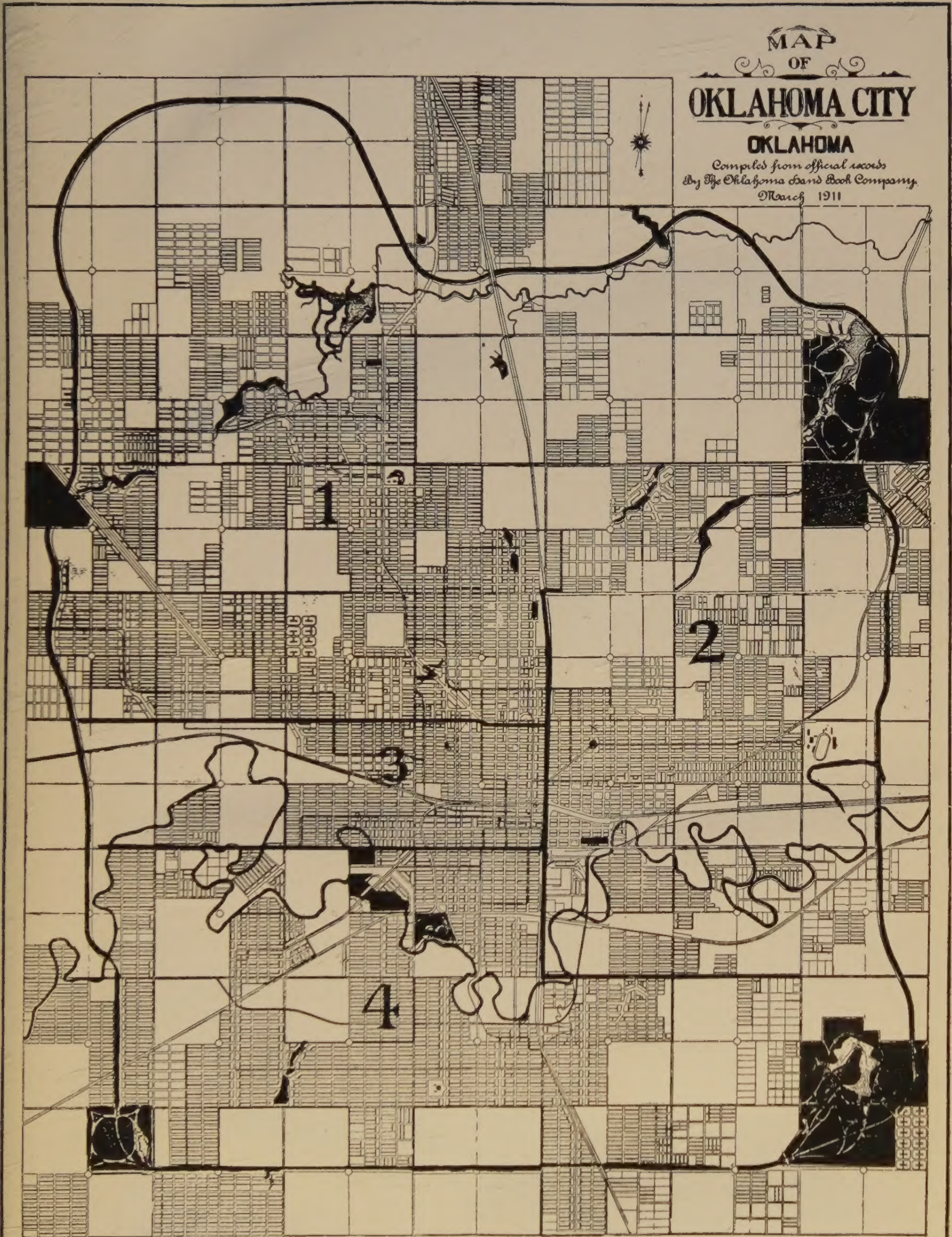
MAP
OF
OKLAHOMA CITY
OKLAHOMA
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March 1911
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MAP OF OKLAHOMA CITY BY WARDS

The Oklahoma Public Health Surveys

OKLAHOMA CITY

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Jules Schevitz, B. S.

Oklahoma Tuberculosis Association
Oklahoma City, Okla.

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Preface

IMPROVEMENT in the health of any city, state, or nation, is dependent, to large measure, on the knowledge and understanding of the existing conditions. Reforms based on speculation and doubt are less likely to result in permanent benefits than improvements put into effect as a result of careful and scientific analysis.

As an organization vitally interested in the public health of the State of Oklahoma, the Oklahoma Tuberculosis Association, since its inception, has felt that its great work was to ascertain the exact status of the factors that affect the health of communities all over the state, and, with this data at hand, to attempt to arouse the state and local officials, and the public at large, to the importance of greater interest in the public health. The mere enactment of legislation, or the expenditure of additional funds, or the employment of trained workers is of little avail unless it is accompanied and supported by an intelligent and powerful public opinion.

Both objects have been kept in mind in conducting the public health surveys of urban Oklahoma. Even before the actual publication of this first report, the benefits to the communities and state have already manifested themselves in various ways—sufficient to convince the association that its eforts will be well repaid.

This report is dedicated to the citizenship of Oklahoma which has made this work possible as well by its liberal financial support as by individual co-operation. It is hoped that this first attempt to study the health of an entire state will stimulate every community and the entire body of our citizenship to take an increased degree of interest in all matters relating to the improvement of health conditions.

E. K. GAYLORD, President.
Oklahoma Tuberculosis Association.

Foreword

DURING the past ten years a new force in public health progress has been developed in this country, known as the health survey. Just what a health survey is and what its scope should be, have not been clear. The methods that have been followed in conducting surveys have rarely been exactly alike even by the same investigators.

Some surveys have been very thorough, wide in scope, and very complete and full of original work. The conclusions from such surveys have been based on facts. Other surveys have been very superficial. Conclusions in such surveys are not based on facts and are not as valuable as the former. Then there are other surveys which lie somewhere between these two extremes, and accordingly have greater or less value depending on the type which each approaches. No attempt has been made, so far as the authors are aware, to standardize the scope of health surveys. Nor has there been much discussion if any, as to the best procedure for conducting a survey.

There have been surveys of every description, such as tuberculosis surveys, housing surveys, malaria surveys, typhoid fever surveys, sickness surveys, lunch room surveys, water surveys, surveys of water sheds, schools, hospitals, asylum and other public buildings, geological surveys, biological surveys, pellagra surveys, surveys of rural sanitary conditions, surveys of economic conditions, food surveys, and surveys of almost every activity which interests man. It is only fitting therefore to attempt to define a survey, and in particular to define health survey.

A survey is a general or broad view of a situation or set of conditions. A health survey may be defined as an investigation conducted by a trained corps of workers to determine the exact status of those conditions that may affect the health of the community, directly or indirectly.

The health survey of Oklahoma City is unique for several reasons. First, it represents a complete and thorough scientific investigation into health conditions and the protection of the public health. Second, the work was done almost completely by the authors, so that first hand information was obtained in every case. Third, the community was thoroughly organized for the survey, and prior to and during its progress an active campaign of publicity and education was conducted aiming to awaken the community spirit to an active interest in health. This campaign proved successful. Fourth, the health survey represents an undertaking by an anti-tuberculosis association, as an effective means of combating tuberculosis. In order to diminish the ravages of tuberculosis it is necessary not only to attack the disease directly, but also to attempt to improve the general sanitary conditions and those other factors which affect health and vital resistance. It is in effect a more modern and fuller appreciation of Mills-Reincke prenomenon. Fifth, the Oklahoma City survey represents one of a series of health surveys conducted in all principal cities of Oklahoma. This is the first time in the history of sanitary science that a complete and intensive health survey of urban conditions in an American state has been attempted. It represents a precedent which should lead to much good. For, in order to improve health conditions in a community or state, it is necessary first to know the exact status of the conditions that prevail. With such knowledge available, it is possible to reorganize health activities wisely and well.

The health survey was conducted under the auspices of the Oklahoma Tuberculosis Association, but was placed under the immediate supervision of a Central Health Survey Committee, composed of leading citizens from every walk of life in the community. Various subcommittees were appointed from the Central Committee, such as the Committees on Housing, Publicity, and Transportation. The Housing Committee was composed entirely of women. The complete organization for this part of the survey is described in the introduction to the chapter on housing.

The survey was conducted during June 1918. The data that have been collected are the result of inspections, laboratory analyses, examination of previous reports and records, and information obtained through conferences with responsible officials. The forms that were employed in the work, are the result of a careful analysis of some of the best in the country that were available. Whenever possible, improvements were made. This is particularly true of the housing inspection card, which was devised especially for the surveys.

Considerable aid was obtained from the Oklahoma State Department of Health. Two state sanitary inspectors visited and scored the lunch rooms and restaurants, and the state laboratories conducted all the tests on water and milk. Our best thanks are due to the State Department of Health for their co-operation, and to the individuals who conducted the work.

During the Oklahoma City health survey, Dr. Gayfree Ellison of the University of Oklahoma was also employed to aid in he collection of the data. The information obtained by him deals essentially with the organization and activities of the health department and the hospital facilities. At the end of the survey Dr. Ellison was called into military service. Acknowledgement is made here of the debt which the report owes to Dr. Ellison.

The compilation of the tables and the reading of the proof represented a large task. Particular thanks are due to Miss Louise V. Peirce for her constant and valuable aid and to Miss Edith Swaine, who read and criticized the entire report. Acknowledgement is also made of the loyalty and devotion of the clerical assistants who aided in the preparation of the report.

Finally, we wish to express our gratitude to the Central Health Survey Committee and especially to Mr. J. F. Owens, its chairman, and to the various subcommittees for their aid, co-operation and fine public spirit. Their encouragement and hopes always served as a helpful stimulus for our best efforts. Many thanks are also due to the earnest and civic spirited women who aided in making an unusually complete housing survey, and to all others who aided in supplying transportation, or other necessary assistance.

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I.

Introduction

OKLAHOMA CITY is the largest city in the state. It is also the largest railroad and industrial center in the state. Most of the agricultural and industrial products of the state usually pass through Oklahoma City on their way to other parts of the country. Geographically it is centrally located.

The city covers an area of nineteen square miles and has an elevation of 1,247 feet. The climate is pleasant and fairly dry. Extreme cold is rather unusual, although extremely warm weather is frequent during the summer months. The absence of excessive humidity, together with a remarkable drop in temperature towards evening and a delightfully cool, refreshing south breeze, makes the climate entirely satisfactory. The average annual rainfall during the past twenty-eight years has been thirty inches.

The city is in the heart of a large and flourishing agricultural district where wheat, cotton and alfalfa represent the most important crops. In the city itself there are large jobbing and retail establishments, machine plants, automobile factories and three large packing plants. The latter employ a large number of men and women, particularly of the unskilled class.

Excellent churches and recreational facilities abound, although the latter could be more extensive and more thoroughly organized. The city has two large parks, one of which in particular draws many people seeking recreation in boating, fishing and bathing. The many miles of asphalt paving make automobiling a pleasant form of recreation.

Oklahoma City is a community with a native and intelligent popuation. Many of its leading and enterprising citizens have come from other parts of the country, particularly from Texas, Kansas, Missouri, Illinois, Indiana and Ohio. Some have also come from New England. All are alert and civic spirited, keenly anxious to promote the welfare of the community and place the city among the leaders in progressive, constructive undertakings.

For a city to have grown so rapidly and along such sane and modern lines, bids well for its future development. Oklahoma City is essentially one of fine, comfortable residences. The demand for many additional homes, and the energetic campaign which is being waged to meet this demand, testify to the rapidly expanding growth of the city. The fact that so many people own their own homes indicates that the residents are intelligent, thrifty and progressive.

II.

Water Supply

A PURE and adequate water supply is universally recognized today by all municipalities as a fundamental, indispensable requirement for the health, comfort and commercial interest of a community. A safe supply usually means a low death rate from typhoid fever and other intestinal diseases. An adequate water supply is essential in order to practice the principles of personal hygiene which deal with body cleanliness.

From time immemorial the importance of an adequate and safe water supply was recognized by peoples all over the world. Cities would spring up around those sources of supply where the water was both plentiful and safe. Sometimes where this was not the case, much effort and wealth were expended in order to bring such a supply to the people. Even today, communities willingly spend large sums of money for this purpose, for it is realized that such a supply is perhaps the most essential element in municipal sanitation. The need for reliable and accurate data concerning the source, quantity and quality of the water supply is therefore of prime importance.

History of Public Supply

Before considering the present water supply and the proposed additions, it will be of interest to describe the history of its development. The original water works for Oklahoma City was built in 1893, when the population of the city was about 5,000. This plant, which was located at Dewey and Elm streets, was built by a private company, and the water was obtained from several wells. As the demands of the city grew, this supply was supplemented by the addition of other wells, nearly all of which were shallow. The total supply from all the wells was about 1,000,000 gallons per day. With the more rapid growth of the city it was found necessary to supplement the supply, and for this purpose water was obtained from the North Canadian river. By 1906 the wells had been abandoned and all the water was obtained directly from the river. This water, which was not treated or purified in any way was furnished to the community and consumed raw.

In 1900 the city had come into possession of the water works and water system, and in 1906 bonds were voted for a new water station. The new plant was completed in May, 1907.

The plant consisted of two low lift pumps, several high pressure pumps, four filters, a coagulating basin, and a small clear water basin. At this time the population of Oklahoma City was about 30,000 and the average daily water consumption was between four and four and one-half million gallons. In 1909 it became necessary to install four additional filters together with a large clear well and a second settling basin, and in January, 1911, another coagulating basin was added to the system. In the fall of the same year the first concrete dam was completed and three low lift pumps were added.

The severe drouth experienced in 1911, due to the shortage of the supply of the North Canadian river, brought about a careful study of the situation in order to provide for an increased water supply. The demands of a rapidly growing city, as well as protection against the serious fire menace which existed at times of water shortage, had to be met, and so a committee of engineers was appointed to make recommendations for an additional source of supply.

The Present Supply

The present source of water supply for Oklahoma City is the North Canadian river, which yields a fairly hard water, but which is nevertheless considered good. The drainage area above Oklahoma City is approximately 10,000 square miles, and the average rainfall of this watershed is probably about 20 inches, although the average rainfall at Oklahoma City is about 31 inches. In referring to the North Canadian river as a source of water supply, the United States Geological Survey (Water Supply Paper No. 148, page 92) reports as follows:

> "The North Canadian river has perhaps the best water of any of the larger streams of Oklahoma, owing chiefly to two causes:
>
> "FIRST, The river is fed largely by tertiary springs, and
>
> "SECOND, It does not flow through regions of salt springs.
>
> "The waters of Salt Fork, Cimarron and Red rivers are salty, and the South Canadian and Washita rivers are derived largely from the red beds, and consequently contain both gypsum and salt. The water of the North Canadian on the other hand is usually soft and of good quality. There is more timber along the banks of this stream, the flood plain is more uniform, and in general it appears more like an eastern river than any of the others mentioned except the Washita."

After carefully studying the various sources of supply the committee of engineers agreed that the best plan was to build a large reservoir on the North Canadian river where the water might be stored during periods of flood flow and from which the water might be conveyed to the present plant and pumping station by a gravity canal. The water will be treated by rapid sand filtration, after which it will be pumped into the water mains leading to the city. This reservoir will cover an area of 688 acres and the water will be collected by means of a concrete dam whose maximum height will be 60 feet and whose length about 1250 feet. The capacity of the proposed reservoir will be 6,800,000,000 gallons. The average depth of the water in the reservoir will be 7 feet. The water will leave the reservoir through a 42-inch conduit and will be conducted to the purification plant for treatment.

It is estimated that this arrangement will provide the city with an ample supply of water up to 1930 at least. Unfortunately the new supply will not be obtained above El Reno and because of that the sewage which that city is discharging into the North Canadian River will not be avoided. This is of great importance since at certain periods of the year, when the flow in the river is low, the sewage from El Reno and also from Yukon makes up a considerable portion of the available water in the river. Not only may this create an unusual strain on the filtration plant, but the pollution will serve as a constant, possible source of intestinal disease such as typhoid fever. It is true that the water will be mechanically filtered and chlorinated, but the aim of a community should not be to purify a sewage polluted

A view of the North Canadian River coming over the dam located near the water works. The intake for the city water supply is located a little above the dam on the right. The water is very turbid.

stream for its water supply, but to obtain a supply that is as perfectly pure as it can be, at its source.

At the time of investigation the average water consumption of Oklahoma City was 7,500,000 gallons per day or about 75 gallons per capita. During the summer, this rate usually increases to 8,500,000 to 10,000,000 gallons per day. In the winter it decreases to 6,500,000 gallons per day. The intakes are located in the North Canadian river at West Third and the river. The river is about 80 feet wide at this point. This is also the location of the water purification plant. There are three intakes, each of which is about 16 inches in diameter. These extend about one-third of the way into the river and enter the plant at about an angle of 45 degrees to the river. The water passes through one-inch screens at the intakes and before entering the sedimentation basin is dosed with iron sulphate and lime, in order to remove the suspended matter. One grain of iron sulphate, equivalent to 17.1 parts per million, and 1.25 grains of lime, equivalent to 21.4 parts per million, were being added to each gallon of water at the time of inspection.

Sedimentation basin number 2. This basin has several partitions which are submerged. Because of this the maximum period of sedimentation is not obtained.

After sedimentation the water passes through eight sand filters at the rate of one million gallons per day for each filter.

After filtration, the water is disinfected by addition of liquid chlorine, the amount added being 34 pounds for 8,500,000 gallons of water or 0.46 parts per million. As a rule the amount of chlorine added is about 26 pounds for 8,500,000 gallons or 0.34 parts per million. The water then flows to a clear well whose capacity is 7,000,000 gallons from where it is pumped into the mains.

The settling basins are 200 feet long and 60 feet wide, and each is divided longitudinally into two parts in order to obtain an increased period of storage. A third basin is 100 feet long, and 70 feet wide and is built with staggered baffles in order to insure increased storage. At the time of inspection the water in this basin was above the level of the baffles, thereby permitting the water to flow directly from one end of the basin to the other, without the increased storage.

A view of the sedimentation basin number 1, showing the water entering the basin in the background, and coming out after sedimentation, in the foreground.

One-half of a settling basin is washed and cleaned every day. Since there are three basins and each is divided into two parts, each division is cleaned once in six days.

The filter beds are 28 feet 3 inches long, 16 feet 8 inches wide and 7 feet 10 inches deep, each filter having a surface area of 426 feet or .01 of an acre.

Outlet half of one of the sedimentation tanks at the water works. The tank has been emptied and cleaned. The trough in the floor of the tank leads to the sewer, and is used to carry off the sediment when the tank is cleaned.

The filters are composed of red wing sand, 4 feet deep. At the bottom there are brass strainers and brass perforated pipes which are used in washing the filters. The filters are washed first by shutting off the supply of water and agitating the sand by means of compressed air sent through the pipes below. This releases the dirt which adheres to the sand particles. The flow of water is then reversed and the dirt is washed into the sewer. When the water is fairly turbid four filters are washed every day. When the water is clear the filters are washed every second day. It would be desirable to determine more accurately when the filters need washing, by the introduction of gauges. It is also important to ascertain whether the coagulant used is giving the maximum efficiency. A filter should not serve the purpose which coagulants are supposed to render. At the time of inspection, the chemical treatment did not appear to produce a clear water, and it is believed that the sedimentation period employed was too short to give the best results.

Two large clearwells from which the treated city water is pumped to the city. The one in the background is 700 ft. x 287 ft. x 17 ft. The one in the foreground is 116 ft. x 116 ft. x 19 ft. The water enters the smaller clearwell from a smaller one. Instead of utilizing the maximum storage capacity the water is short circuited from inlet to outlet, thus losing the value of the increased storage period.

A 24-inch main conducts the filtered water to three clear wells whose dimensions are as follows:

No. 1—116x116x19 feet.
No. 2— 67x 77x19 feet.
No. 3—700x287x17 feet.

The capacity of wells one and two combined is 1,800,000 gallons. The combined capacity of the three wells is 20,000,000 gallons. The water passes from well No. 2 to well No. 1 and is then pumped to the city through a 24-inch main. Clear well No. 3, which is the largest, is used only to store enough water for reserve to be used when the supply is low. It would be desirable to connect the three clear wells in series and to pump the water to the city from the last well. This would augment the period of storage and would result in the reduction of the number of bacteria which may be present in the water. It is a well established fact that water purifies itself in storage. Inasmuch as the city has the facilities for lengthening the time of storage, it is essential that this advantage be utilized.

The new storage reservoir which is being built at the present time will have a capacity of 2,800,000 gallons and due to the peculiar formation of the reservoir the period of storage will be long. The water will have a chance to purify itself to some extent, before reaching the purification plant.

The water is pumped into the city mains by a 10,000,000 gallon pump. An 8,000,000 gallon pump is also available, but this is held in reserve while the larger pump is in operation. In case of emergency, as when a break-down occurs, a 6,000,000 gallon pump and two 3,000,000 gallon pumps can be used to supply the city with water. Such an arrangement is very desirable and wise. After leaving the pumping station through the twenty-four inch main, the water later enters a twenty inch main and then mains 10 inches, 8 inches, 6 inches, 4 inches and finally to 2 inches in diameter. The 12 inch and 6 inch mains are most commonly used.

The pressure maintained in the city is 80 pounds per square inch.

The water supply is entirely metered, except that portion which is used for fire purposes and for city sprinkling. Altogether there are 10,800 metered house connections and the minimum charge for water for domestic use is 75c. The charge per thousand gallons up to the first 10,000 used, is 20c; above this amount and up to 100,000 gallons the charge is 15c per thousand. Above this amount the charge is 10c per thousand gallons. The rate is the same for both domestic and commercial purposes.

The Semi-Public Supply

It is unusual to find in a city similar in size to Oklahoma City, that many persons depend upon private or semi-public supplies for their drinking water. This is true however in Oklahoma City, and is due to the widespread belief that the public supply is either too salty or unsafe for drinking purposes. As a result, many private enterprises have developed whose sole function it is to supply the people with well water. Because of the close relationship of water and disease, such private enterprises become a matter of great public concern. They thus come within the scope of the survey, and therefore the study of the water supply includes a careful survey of these private sources, from a sanitary standpoint.

There are thirteen companies which distribute water in the city. One of these sells distilled water only, and therefore cannot be considered on the same basis as the others. Each well from which water is obtained for sale was inspected thoroughly. For this purpose a form was prepared which called for information regarding the location of the well, its depth, the daily output in gallons, number of employees, medical inspection of employees, the number of customers, price per five gallon bottles, distance from the well to any source of pollution, like a privy, manure pile, or exposed garbage; the slope of the ground in the vicinity of the well, toilet facilities for employees, washing facilities, methods employed in cleaning and sterilizing bottles and an account of the treatment of the water.

The following table presents in a concise form the information that was gathered,

TABLE No. 1

THE AMOUNT OF WATER SOLD IN OKLAHOMA CITY FOR DRINKING PURPOSES BY ALL WATER COMPANIES.

Name	No. of Employees	No. of Customers	Approximate Daily Output in Gallons	Sale of Water per day	Depth of Well
Acme	4	300	250	$ 10.00	150-ft.
Crystal	4	1000	1500	45.00	185-ft.
Capitol	4	1000	1000	40.00	200-ft.
East Highland	1	300	300	12.00	165-ft.
Economy	2	500	1000	30.00	150-ft.
Ever Pure	5	2000	800-1500	48.00	164-ft.
Electrified	2-5	4000	2500-3000	137.50	180-ft.
Excelsior	6	1600	2500	100.00	125-ft.
Lewis-Lithia	2	400	500	25.00	190-ft.
I. L. Lord	1	800	750	22.50	113-ft.
Palace	2	400	300	9.00	229-ft.
Zylite	3	500	750	30.00	218-ft.
Totals	39	12,800	12,800	$509.00	

Amount of drinking water sold per year, 4,672,000 gallons.

Approximate cost of drinking water per year $185,785.

Of the thirty-nine men employed in handling and distributing the water not one is physically examined to determine whether or not he is a disease carrier. The table shows that 12,800 families and public eating places buy water, and that the amount of drinking water sold pe year is more than four and one-half million gallons. The cost of the water varies. For residences the cost is generally 20 cents or 25 cents for five gallons. In two cases the cost was 15 cents per five gallon bottle. For restaurant purposes and for places where water is consumed on a large scale, the rates are lower, usually from 7 cents to 12 cents per five gallon container.

Based on the figures obtained from the consumers, and the amount of water sold, it is probable that the cost of drinking water reaches the enormous figure of $185,785.00 per year. Even if this figure be somewhat inflated it is nevertheless true that the cost of drinking water is very large. Inasmuch as the public water supply can be made both pure and palatable this expenditure seems to be quite unnecessary. While it is not recommended that people cease buying well water at this time, we should look forward to the day when the people will be able to obtain their drinking water from the public supply.

It will also be observed from the table that the wells in use are very deep, the depth ranging from 125 feet to over 200 feet. This is of considerable importance in insuring a safe supply from these sources. The sanitary inspection of the premises around these wells did not disclose any offensive conditions. Privies and manure piles were absent. In only one case was there any possibility of pollution, but inasmuch as the wells are encased in cement or concrete for a considerable depth, there is apparently little likelihood of surface drainage contaminating the supply.

In most cases toilets were provided and these were generally located in the house adjoining the well. These toilets are connected to the sewer and cause no nuisance. In three cases toilets were not provided at all and in two instances the toilet was maintained in an unsatisfactory manner. As a rule washing facilities were available for toilets located in the house, but where the toilets were not so located washing facilities were either absent or unsatisfactory. Where washing facilities were provided, roller towels were in common use.

The most serious complaint to be made of the semi-public water supply is the improper and inadequate cleansing of the returned bottles. The bottles which are returned to the plant are frequently dirty. The present practice of cleaning the bottles consists in washing them in cold water which may or may not contain washing powder, and then rinsing them in a tub of water, after which they are refilled with water and delivered to the people. Sometimes a little hydrochloric acid is used to destroy the algae growths which may be present in the bottle. The rinse water which is employed becomes polluted in a short time, and instead of cleansing the bottles, actually contaminates them. In only two cases were the bottles rinsed in fresh, pure water.

The proper washing of bottles is one of the important practices in connection with the sale of water. Not only should the bottles be thoroughly washed in order to remove any adhering dirt but they should be rinsed in fresh pure water, and if possible, fresh running water should be employed. This water may be obtained either from a faucet, or better yet, from a fountain spray. The addition of a small amount of sodium or calcium hypochlorite will help this cleansing and sterilization. It is apparently impossible to use steam in the sterilization of the bottles on account of the large number of bottles which are broken by this method.

The water from the wells is usually filtered through stone filters which are cleaned by means of scrapers at regular intervals.

Another unsatisfactory practice is the repeated use of the returned corks without sterilization. In only a few cases are the corks boiled before being used again. This should be the invariable practice. Furthermore, it is desirable to prevent corks from coming into contact with the water, and this can be readily done by wrapping a piece of waxed paper around the cork. The cork being organic in nature, bacteria that lodge in the crevices, may multiply. Infected particles might also remain in these crevices. If precautions are not taken, these materials may enter the water, since the water comes in intimate contact with the cork. It would, therefore, be advisable to protect the water from pollution or infection by providing a suitable cover for the cork.

It is also recommended that all bottles be provided with dust proof caps. This was practiced only by two dealers. In one of these cases the bottles contained distilled water. Since the mouth of the bottle is frequently handled by the employees, the practice of providing dust proof paper caps is particularly desirable. Otherwise the mouth of the bottle may become infected or polluted.

At the present time there is no ordinance governing the sale and inspection of water from these wells. Inasmuch as this supply affects a considerable portion of the population such a regulation is highly

TABLE NO. 2

Analysis of Oklahoma City Water

Chemical Tests:	April 6	April 24	May 30	June 17	June 17	June 25	June 26	June 27	June 29
Results in Parts per Million				(1)	(2)				
Albuminoid Ammonia	0.106	0.090		0.140	0.120				
Free Ammonia	0.026	0.026		0.010	0.006				
Nitrogen as Nitrates	None	None		None	None				
Nitrogen as Nitrites	None	None		None	None				
Chlorine	213	209		125	125				
Total Solids	920	900		540	530				
Alkalinity	205	210		100	126				
Oxygen Consumed	1.5	2.3		3.1	4.3				
Bacteriological Tests:									
Bacteria per cubic centimeter on Agar after 24 hours at 37 degrees C.	6.600	240	250		90	320	260		90
Per cent of Gas in Lactose Broth after 24 hours at 37 degrees C. 1 c.c.	50%	0	15%		35%	Trace	50%	15%	Trace
5 c.c.	5%	0	35%		30%	30%	Trace	50%	20%
10 c.c.	Trace	30%	1100%		35%	30%	60%	60%	Trace

desirable. The wells should be inspected regularly and in addition samples of water taken both from the wells and the bottles should be collected and analyzed.

Laboratory Analyses

In order to determine whether the waters in use were safe for drinking purposes, samples of the public supply were taken from various taps in the city and also from the wells from which waters were sold. In testing the well waters, samples were taken directly from the well and also from the bottle. The accompanying table gives the chemical and bacteriological analyses of the city water, most of which were made during the month of June as part of the work of the survey.

It will be seen from the analyses that the public water supply is generally polluted and probably unsafe most of the time. This is very likely due to inefficient operation at the water plant rather than to any other cause. The proper and intelligent administration of the present plant together with the final disinfection of the water by the use of chlorine, should make it possible to furnish a thoroughly safe water supply. When the new supply is obtained it is likely that the water will not be as seriously polluted as is the water obtained from the North Canadian river at the present time. This water will probably lend itself more readily to efficient treatment and there should be no difficulty in rendering the water safe.

The chemical analysis show that the water is not too hard and the chlorine content is not too high to be objectionable. In other words, the water obtained from the North Canadian river can be used legitimately as a source of drinking water for the city, but in order to furnish a safe supply at all times a trained water engineer must be placed in charge of the treatment plant.

The accompanying table gives the results of the analyses made of the different well waters that were obtained.

Thirteen samples of water obtained directly from the wells and nine samples of water obtained from the bottles were examined. It will be seen from the tables that the waters obtained directly from the wells were almost always safe. In only two cases was there any doubt. On the other hand the waters obtained from the bottles showed that three of the nine samples were probably unsafe. Two were considered safe, three as probably safe and one as suspicious. The analyses indicated that the well waters are frequently seriously polluted in the process of filling. The pollution is undoubtedly due to the improper methods employed in cleaning the bottles and emphasizes the importance of regulating and supervising the cleaning of the bottles, so as to insure the delivery of a safe and unpolluted water.

Summary

Public Water Supply:—The present supply which is taken from the North Canadian River has been found to be inadequate. To overcome this shortage, a large storage reservoir is being built which will be fed by water obtained below El Reno. This water will probably receive the sewage pollution of El Reno, and it will be important therefore to take every possible precaution to treat the water efficiently in order to prevent the occurrence of an epidemic of intestinal disease. The supply is treated by rapid sand filtration, and is then disinfected. The purification plant is not operated scientifically however, and as a result, evidences of pollution are frequently obtained when bacteriological examinations are made.

The Semi-Public Water Supply:—A very large amount of water obtained from private wells is sold in the city. The annual cost of well water reaches a very high figure. The wells are all deep and well protected, and as a result, the water is not polluted. The methods employed in washing the bottles are usually so poor, that the well water as it is delivered to the consumer is frequently polluted. Corks which are reused are not sterilized. As a rule the bottles are not capped with a dust proof cover to avoid contaminating the mouth of each bottle.

Recommendations

1. The water purification plant should be placed under the direction of a trained and efficient sanitary engineer.

2. An ordinance should be framed which should include all the recommendations made in the chapter on semi-public water supplies aiming to insure the delivery of a safe, bottled water.

3. Provision should be made for the frequent inspection of semi-public and private wells, and for the collection and analysis of samples of water from the public, semi-public, and private water supplies.

III.

Sewerage and Sewage Disposal

TOGETHER with the necessity of supplying a pure and adequate water supply, one of the essential functions of a municiality is to furnish means for removing the wastes of the city. This is of utmost importance in order to safeguard the health of the people. Perhaps no wastes are so important from the standpoint of removal, as the wastes of human origin and those resulting from the various processes connected with life. The analysis of the situation in Oklahoma City shows that most of the city is well sewered. Only certain parts of the city, such as the southeast portion of Capitol Hill, the southern part of Packingtown, the Walnut Grove Addition and a few streets at the extreme north of the city are yet unsewered. These sections of the city should be furnished with sewers as soon as funds are available.

The two main outfall sewers located on First St., discharging into the North Canadian River. The brick sewer is five feet wide, and discharges sanitary sewage. The other is a 10.5 feet concrete egg shaped storm sewer.

A separate system of sewerage is employed, which means that the sanitary sewage and storm water are removed by separate sewers. In a few parts of the city the combined system, which permits the use of the same sewer for both sanitary sewage and storm water, is still employed. No information was available regarding the volume of sewage discharged each day.

No attempt is made to subject the sewage to any treatment at the present time. The practice is to permit the sanitary sewage and stream water to empty into the North Canadian river from numerous outfalls located below the intake of the water plant. This system of disposal will be modified somewhat in the near future by the building of a large sewer which will conduct the sewage from the numerous outfalls now in use, to a point located east of the city, immediately south of the M. K. & T. roundhouse. Although this is a very desirable improvement it is likely that the nuisance resulting from the absence of sewage treatment will become aggravated at that point.

TABLE No. 4.
SHOWING THE NAME, LOCATION AND THE SIZE OF THE SEWER

Sewer		
Sanitary Sewers		
Packingtown	Walker Ave. & Ash St.	24 inches
Capitol Hill	Broadway & River	15 inches
Washington Ave.	Between California & Grand	24 inches
Reno Ave.	Between California & Grand	18 inches
First St.	Between California & Grand	48 inches
Laird Ave.	Phillips Ave. & River	15 inches
Kate Ave.	Kate Ave. & River	15 inches
Storm Sewers		
First Street	End of Grand Ave.	7½ ft. x 10 ft.
Choctaw Ave.		
Kate		
Broadway	Robinson & 30th	
Military Ave.	36th St. & Arlington	
Pennsylvania Ave.		4½ ft. x 6 ft.
Blackwell Ave.		3½ ft x 5 ft.

In the summer time, particularly, the nuisance is likely to become serious. At that time the stream flow in the North Canadian river is very low and the river virtually becomes an open sewer. In order to prevent this serious nuisance from occurring, it will be necessary eventually to build a sewage disposal plant at the point of outfall and to treat the sewage sufficiently until all danger is overcome. It is the duty of the city to do this, as several communities located further down the stream depend upon this river for their drinking water supply. Except for those wastes which are obtained from Packingtown, very little trade wastes enter the sewers at the present time. The Packingtown sewage is particularly offensive and gives rise to serious nuisance at the point of discharge.

In certain sections of the city, such as Packingtown, numerous open privies still abound. These privies constitute not only a serious nuisance, but also a menace to the public health. Sewers should be built in these places as soon as possible, in order to abolish this evil. Until the sewers are built however, it should be the duty of the health department to cause each open privy to be made fly tight, modern and thoroughly sanitary. The exact distribution of open privies in the city is recorded in the chapter on housing. There the subject is also discussed more completely.

Summary

On the whole, the city is well sewered, although there are still certain sections where open privies abound. These should be removed as soon as possible, and in the meantime be made thoroughly safe. The sewage contains also a fairly large amount of organic trade wastes which are particularly offensive during the warm weather. No method of sewage treatment is employed.

Recommendations

1. That the municipality investigate the need of treating the sewage at this time, particularly during the warm weather when the stream flow is low.

2. That the entire city be completely sewered as soon as possible in order to abolish the existing privies.

3. That those privies which exist on property abutting sewers be abandoned, and that the owner be required to install modern, flush tank toilet facilities, where running water is available.

IV.

Collection and Disposal of Refuse

ANOTHER function of municipal government is the collection and disposal of garbage and similar wastes. In some communities this function is performed by the city itself. In other cases the city permits private individuals to collect and dispose of the wastes. In Oklahoma City this duty is performed by two private individuals who are granted permission to carry on this work. These individuals collect the garbage from the residential sections twice a week and daily from the business districts. In the case of the business districts the garbage is collected at night. As a rule the garbage, paper and other forms of trash are collected in one wagon, the garbage being placed in galvanized iron cans in the rear of the wagon. The garbage is then taken to the city dump where the cans are emptied into the iron wagons and then taken to the piggery.

There are two piggeries where the garbage is disposed. One is located southeast of the city and the other is northwest of Packingtown. The owner of the piggery located southeast of the city pays $1.00 a year for the privilege of having the garbage brought to his feed lot. At the same time he has the right to salvage all iron, junk and other materials that are brought to his place. The collection of garbage in the city is performed by municipal employees who haul the garbage to the dump, at which point it is turned over to the contractor.

From here the garbage is hauled to the place where the hogs are fed. At the time of inspection, however, the hogs were located right at the dump, making it unnecessary for the city scavenger to haul the garbage which was delivered at that point.

Garbage from the business district is also collected by municipal employees, but this material is collected in closed wagons. This garbage is taken to the city barn which is located on Hudson between Main Street and Grand Avenue. It is then turned over to a second scavenger and removed by him to a piggery located southwest of the city. For this garbage the city obtains $1,248.00 per year.

For the privilege of having the garbage removed, the residents are required to pay 35 cents per month for each house. This fee may be increased, depending upon the size of the house, the number of families and the amount of garbage. The largest fee that may be charged is $50.00 per month, and this sum is obtained only from the large hotels in the city.

Nine wagons are used for the collection of garbage and trash and only one of these is used exclusively for garbage. Altogether twenty men are employed in the collection of the garbage and trash.

The amount of garbage collected in the city for about two years may be observed from the following table. The information could be obtained only for the months of July 1916 to April 1918.

TABLE No. 5.
TONS OF GARBAGE COLLECTED BY MONTHS.

Month	1916	1917	1918
January	---	234	199
February	---	230	195
March	---	236	194
April	---	239	190
May	---	241	---
June	---	242	---
July	248	245	---
August	243	238	---
September	240	238	---
October	237	230	---
November	229	220	---
December	228	226	---
	1,425	2,819	778

Total for 22 months ---------- 5,022 tons

Average for month ---------- 228 tons

There seems to be no doubt that the method employed for the collection and disposal of the garbage is both inefficient and unsatisfactory. The city is at the present time practically giving away material which is of considerable value. If it is desirable to continue the present system, the city should at least receive a much larger sum from each contractor. It is doubtful, however, whether the present system is the best one for the city. Most people have come to regard the collection and disposal of garbage and rubbish as a municipal function. Just as it is the duty of the city to furnish a public water supply and to remove the liquid wastes by a satisfactory sewerage system, so people regard it as one of the duties of the city to remove the garbage and rubbish. The city should, therefore, introduce a system for the future collection and disposal of garbage. This could be done without increasing the taxes, for the city can dispose of the garbage by feeding it to hogs and derive the profits which are now being made by private individuals. Even if the city does not take over this work, and prefers to continue the present system, there is no reason why the city scavengers should charge for the services they render.

This service should be granted free to all the residents in return for the garbage which they offer free of charge to the contractor, and which he uses as food for his hogs, and ultimately for monetary profit.

In addition to rendering free service, the scavenger in Tulsa pays the city more money than Oklahoma City obtains under its present agreement. There is no question that under the present contract the city is suffering a great injustice. The present system whereby each resident is charged directly for the collection of garbage, tends to result in incomplete collection, because there are many persons who are unwilling to pay for this service. Thus many residents dispose of their garbage in their own individual way, and as a result many nuisances are created.

A view of the piggery in the southeast part of the town. Both garbage and rubbish are dumped here, the hogs picking out the edible from the non edible material. The conditions here were very unsatisfactory. Literally millions of flies buzzed about the decomposing organic matter.

The garbage is sometimes disposed of by burning or feeding to chickens or simply by permitting it to rot on the surface of the ground.

Flies are attracted; they breed and multiply, and as is well known, they may possibly endanger the health of the people. The ultimate solution of this problem lies in having the city take over the entire problem of refuse collection and disposal, or if this is not possible to introduce a system of free collection by a private individual, which will be similar in form to the Tulsa plan. For the analysis of the methods of garbage disposal employed by the residents, see chapter on housing.

The Piggeries

In connection with a study of the garbage situation sanitary inspections were made of the two piggeries at which the garbage is fed to hogs. At the piggery located southwest of town, there were about 300 hogs, but the number generally varies from 300 to 1,000. Conditions here were very unsatisfactory. Not only was the place exceedingly dirty and vile, but objectionable odors and swarms of flies were also present. It is estimated that about two tons of garbage are delivered here every day.

This shows the appearance of the "Dump" in the southeastern part of the city. There are several acres of tin cans, each of which is a potential breeding place for mosquitos. Several homes may be seen in the background.

Much of the washings of the pens are permitted to flow down an embankment and form septic pools which soon become loaded with organic matter. It is only natural therefore that these places should be full of maggots.

The garbage which is brought to the piggery is not sorted from the rubbish which may be present, and the mixed refuse, including cans, bottles and other wastes, is fed to the hogs. Later the cans are removed and piled in an adjacent lot. These cans, after filling with water may become a serious place of breeding for mosquitoes. The hogs at this piggery are vaccinated and thereby immunized against hog cholera.

Similar conditions of filth, flies and odors existed at the piggery east of the city. Here too, the conditions were very unsatisfactory. Adjoining the piggeries there were several acres of cans and other forms of rubbish. There is no reason why piggeries, if properly cared for, cannot be maintained in a clean and satisfactory condition. It appears to be the prevailing opinion among men who operate piggeries, that hogs prefer filth. It is certain, however, that hogs will thrive just as well, and even better in the absence of filth, and the advantage to be derived by the prevention of nuisances is obvious. It is urged that some supervision be maintained over these piggeries in order to secure fairly clean conditions.

A pile of manure covering an area of three to four acres and over 9 feet in height, located on the road to the piggery in Packingtown. The man in the picture is six feet three inches tall. The manure pile is constantly burning. The ashes are placed in bags and sold as fertilizer.

Another dump is located at 12th and McKinley. Trash of all kinds is sent to this place, including dirt, manure, papers, rags, bottles, iron, wastes from automobile garages, etc. No animal or vegetable matter capable of decay is supposed to be sent to this dump. The material is used entirely for filling. The dump is in charge of a licensed individual who obtains his renumeration entirely from the junk he is able to salvage.

Refuse Disposal

About four years ago the city built an incinerator on East Grand Avenue for the purpose of disposing of the garbage and other forms of refuse. For this purpose, $40,000.00 was spent, but the incinerator has not been operated, not only because of the expense involved, but also because of its inability to burn the material. It seems a sad reflection on the part of those in municipal service, to permit the expenditure of such a large sum of money without obtaining some benefit in return.

The "Fireless Cooker," otherwise known as the incinerator, which was not in use for a single day. The construction of the plant cost $40,000. It typifies the lack of intelligence and care which municipal officials frequently show in the erection of public works.

If it is at all possible to alter the incinerator without too much cost so that it can be used, this step would seem to be desirable. In that way, practically all the refuse except the garbage could be destroyed without causing the serious nuisances which are frequently found at dumping grounds. It is desirable however, to feed the garbage to hogs if possible, as this is a very excellent way to transform what would ordinarily be waste matter, into food material. The war demonstrated very forcibly how much the race is dependent on food for its health, vigor and vitality.

Near the piggery southwest of town is located a large manure dump owned by the National Stock Yards. To this dump is brought the numerous loads of manure obtained from the Stock Yards. This material is constantly being burned, and covers an area of about three to four acres. The burning manure is then put into boxes and sold as fertilizer. The fly nuisance at this place, although present, was not very serious.

There are however, numerous places throughout the city where horse manure is stored sufficiently long to create a serious fly nuisance and hence, a menace to the public health. This subject is discussed more fully in the chapter on housing. It is worth while to state here that when manure is stored, it should be kept in a fly tight box, having a cover, and a concrete floor; and that the manure should be removed at least once every week. This is particularly important in the spring and summer, when a new crop of flies makes its appearance, once every ten days. If manure is stored for fertilizer purposes, it should be buried beneath the surface of the soil before it is a week old.

Summary

Two scavengers who pay the city an abnormally small return are permitted to dispose of the garbage and other forms of refuse. Most of this material is collected by municipal employees in municipal trucks and delivered to the scavengers. The people are required to pay monthly for the service. The garbage is disposed by feeding to hogs, but the conditions at the piggeries are very unsatisfactory. The conditions at the dumps are equally poor. Because the refuse is collected only from those who pay the tax, many residents dispose of garbage on their own premises in various ways. This gives rise to many serious nuisances. Manure is also improperly disposed. The incinerator which was built by the city in 1914 at the cost of $40,000 has been found to be of very little value and hence is lying idle.

Recommendations

1. That a system of free municipal collection and disposal of refuse be introduced, and that the cost of this new municipal function be paid from the general tax.

2. That the incinerator be properly modified if possible in order to destroy all rubbish and other similar material, but that the garbage be disposed by feeding to hogs, under proper supervision and management.

3. That nuisances resulting from exposed or improperly disposed garbage or manure be remedied through the efforts of the available sanitary inspectors and police.

V.

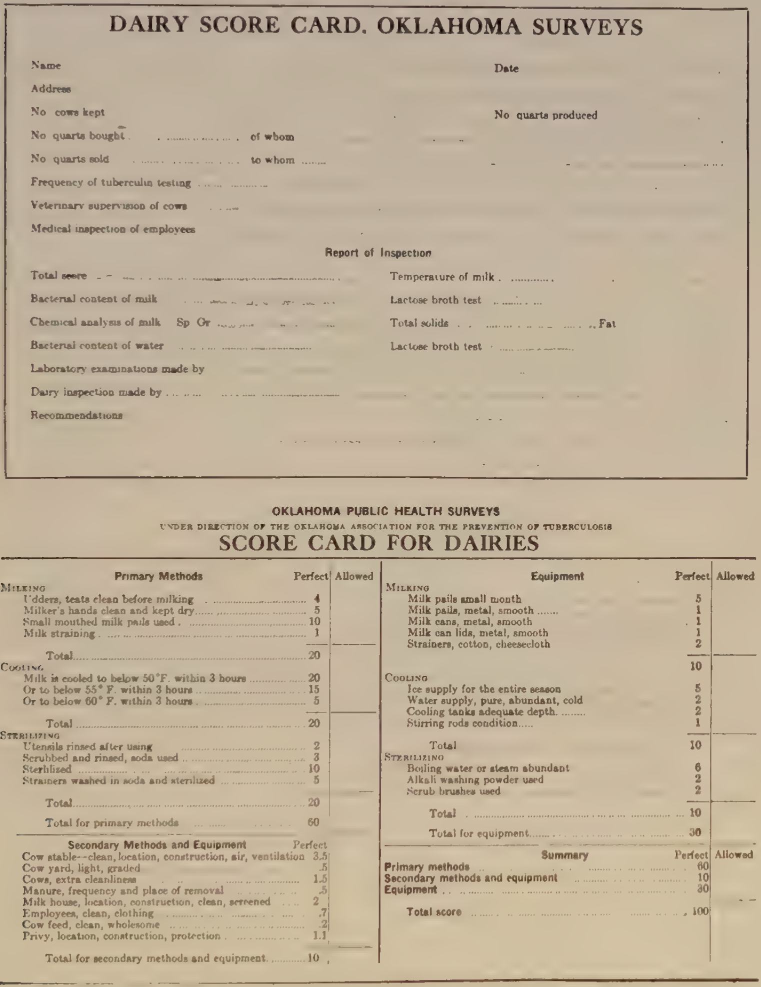
Milk Supply

MILK is such a well balanced food that it is not only an ideal food for humans but represents an excellent culture medium for bacteria. Recently it has been demonstrated that milk tends to inhibit auto-intoxication and that it contains certain vitamines which are important for good health and growth. It is well known that infants and children depend on milk a great deal. It is therefore exceedingly important that every community be supplied with a clean and safe milk supply. Particular emphasis should be laid on cleanliness of production, the age of the milk, the temperature of which it is handled and transported and its production by individuals free from disease.

The effect of the milk supply on the health of the city is so important that considerable time and attention were given to this part of the investigation in the survey. It was found that most of the milk sold in Oklahoma City is shipped in by the producers located within a radius of twenty-five miles. There are three main distributing dairies which handle the bulk of the retail trade. Several ice cream companies that utilize large amounts of milk, sell a small portion as retail milk, but the amount sold in this way is very small.

Owing to the fact that most of the farms from which milk is delivered to the city are located within a comparatively short distance, the milk is sent to the city in the morning and at night. Another reason for shipping the milk to the city twice a day is that this milk is not cooled, and will become sour within twelve hours. The milk in transit is not iced, and the absence of cooling at the point of production and during the transit enables the bacteria to multiply to very large proportions. This milk which is shipped to the city is delivered entirely to the main distributors and ice cream manufacturers. The milk which is brought to the city by the producers themselves is usually cooled at the point of production and is also iced during transportation. The city ordinance requires that the milk shipped to the main distributors and ice cream manufacturers should be pasteurized. Pasteurization is not required of the milk that is brought to the city by the producers.

At the time of the investigation, the price of milk varied somewhat throughout the city. The cheapest milk was sold at 12½ cents per quart, and the most expensive milk at 20 cents per quart, but the bulk of the supply retailed at 15 cents per quart. All milk sold in the city must be bottled. Much of the supply is sold to grocery stores



DAIRY SCORE CARD. OKLAHOMA SURVEYS

Name
Date
Address
No cows kept
No quarts produced
No quarts bought of whom
No quarts sold to whom
Frequency of tuberculin testing
Veterinary supervision of cows
Medical inspection of employees

Report of Inspection

Total score
Temperature of milk
Bacterial content of milk
Lactose broth test
Chemical analysis of milk Sp Gr
Total solids Fat
Bacterial content of water
Lactose broth test
Laboratory examinations made by
Dairy inspection made by
Recommendations

OKLAHOMA PUBLIC HEALTH SURVEYS
UNDER DIRECTION OF THE OKLAHOMA ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS

SCORE CARD FOR DAIRIES

Primary Methods	Perfect	Allowed
MILKING		
Udders, teats clean before milking	4	
Milker's hands clean and kept dry	5	
Small mouthed milk pails used	10	
Milk straining	1	
Total	20	
COOLING		
Milk is cooled to below 50°F. within 3 hours	20	
Or to below 55° F. within 3 hours	15	
Or to below 60° F. within 3 hours	5	
Total	20	
STERILIZING		
Utensils rinsed after using	2	
Scrubbed and rinsed, soda used	3	
Sterilized	10	
Strainers washed in soda and sterilized	5	
Total	20	
Total for primary methods	60	

Secondary Methods and Equipment	Perfect	
Cow stable—clean, location, construction, air, ventilation	3.5	
Cow yard, light, graded	.5	
Cows, extra cleanliness	1.5	
Manure, frequency and place of removal	.5	
Milk house, location, construction, clean, screened	2	
Employees, clean, clothing	.7	
Cow feed, clean, wholesome	.2	
Privy, location, construction, protection	1.1	
Total for secondary methods and equipment	10	

Equipment	Perfect	Allowed
MILKING		
Milk pails small mouth	5	
Milk pails, metal, smooth	1	
Milk cans, metal, smooth	1	
Milk can lids, metal, smooth	1	
Strainers, cotton, cheesecloth	2	
	10	
COOLING		
Ice supply for the entire season	5	
Water supply, pure, abundant, cold	2	
Cooling tanks adequate depth	2	
Stirring rods condition	1	
Total	10	
STERILIZING		
Boiling water or steam abundant	6	
Alkali washing powder used	2	
Scrub brushes used	2	
Total	10	
Total for equipment	30	

Summary	Perfect	Allowed
Primary methods	60	
Secondary methods and equipment	10	
Equipment	30	
Total score	100	

Reproduction of form used for scoring dairies.

and is then retailed to the people. In this way the producers avoid having extensive milk routes. In 1917 there were 255 stores in the city selling milk.

One phase of the survey was to visit and score some of the dairies furnishing milk to the city. For this purpose the modified score card, devised by Dr. C. E. North was used.

Sanitary Inspection of Dairies

Altogether, forty-four dairies were were inspected and scored. These dairies had a total of eight hundred and ninety-five cows, and delivered to the city 10,264 quarts of milk per day. Of this amount 3,000 quarts were handled by one distributor daily, located several miles from the city. The following table gives the amount of milk sold by the dairymen who were visited, the score card rating, and the date of the last tuberculin test.

It will be seen from the table that most of the dairies near the city practice the custom of testing their cattle once a year. At the time of the inspection. the tuberculin test had just been made in all but four cases. On the whole it is believed that this regulation is rigidly enforced. The shortcoming however, of the situation is the unusually low number of reactors that are found. Frequently all the cows of the dairy are found to be free from tuberculosis or to contain only very few reactors. This is most unusual even in those parts of the country where cows are permitted to remain in the open practically all the time. It is possible that the few reactors that were discovered is due

An excellent milk house where the best possible care is taken to insure a safe clean milk. The milk house was as clean as a very well kept parlor might be. Even the barn was exceptionally clean and free from flies. Note the orderly arrangement of things outside the milk house.

TABLE No. 6.

RESULTS OF DAIRY INSPECTION, SHOWING SCORE CARD RATINGS, ARRANGED ACCORDING TO SCORE.

NAME OF PRODUCER	Quarts of Milk Sold	Primary Methods	Secondary Methods and Equipment	Equipment	Total Score	Last Tuberclin Test
E. C. Smith	60	56.5	9.9	29.5	95.9	This Yr.§
Belle Isle	160	53.0	8.2	30.0	91.2	This Yr.
Spivey	200	54.5	6.1	29.0	89.6	This Yr.
J. S. Short	592	49.0	6.2	29.5	83.7	This Yr.
Hoskins & Lovell	260	47.5	6.9	29.0	83.4	This Yr.
Wallace	200	47.8	6.3	26.0	79.1	This Yr.
Avondale Dairy	200	45.5	8.1	25.5	79.1	This Yr.
Peaster Dairy	115	47.5	6.1	25.0	78.6	This Yr.
S. E. Thorne	200	42.0	7.1	27.5	76.6	1916
Dinwiddie	90	47.0	7.7	21.5	76.2	1916
J. H. Thompson	300	44.5	6.4	25.0	75.9	This Yr.
G. R. Pettie	150	40.0	6.3	24.0	70.3	This Yr.
The Sunset Dairy	150	37.0	8.7	24.0	69.7	This Yr.
W. E. Rowland	152	41.0	6.2	22.5	69.7	This Yr.
C. W. Lessinger	228	38.0	6.5	24.8	69.3	This Yr.
J. H. Stories	180	38.5	5.4	25.0	68.9	This Yr.
Denton	208	36.5	7.7	24.5	68.7	This Yr.
Healds Dairy	120	40.5	5.7	21.5	67.7	This Yr.
Stone Dairy	200	36.8	5.8	24.5	67.1	This Yr.
Hainals Dairy	112	36.0	7.6	23.0	66.6	This Yr.
G. W. Carrier	80	37.5	5.8	23.0	66.3	This Yr.
O. W. Bartel	140	34.0	7.5	23.0	64.5	This Yr.
G. M. Markwell	120	37.0	4.0	23.5	64.5	This Yr.
F. H. Hemmer	16	36.0	6.4	22.0	64.4	This Yr.
E. W. Bonne	190	37.5	6.7	20.0	64.2	This Yr.
C. Sochor	320	38.0	5.6	20.5	64.1	This Yr.
O. B. Houchin	100	37.5	4.0	22.5	64.0	This Yr.
M. D. Mone	160	36.0	5.6	20.5	62.1	This Yr.
G. C. Ban & Story	225	35.0	4.9	21.0	60.9	This Yr.
N. Gilson	60	36.0	6.2	18.0	60.2	This Yr.
H. G. Little*	3,000	31.0	5.4	22.5	58.9	This Yr.
Southside Dairy	410	31.0	3.9	23.0	57.9	This Yr.
T. C. Stories	230	33.5	5.1	19.0	57.6	This Yr.
M. W. McMannus	35	31.5	5.5	19.5	56.5	This Yr.
Tom Stardard	80	32.5	5.5	18.5	56.5	This Yr.
J. A. Conrey	100	31.5	6.6	18.0	56.1	This Yr.
M. Fishback	75	51.0	7.8	16.0	54.8	This Yr.
F. A. Pierce	100	29.0	5.1	19.0	53.1	This Yr.
Haddox Dairy	200	28.5	4.5	19.0	52.0	1917
R. L. Duke	28	29.5	4.9	16.8	51.2	This Yr.
J. B. Corff	148	27.5	6.8	13.0	47.3	This Yr.
Tindsley	400	22.5	3.2	15.5	41.2	This Yr.
C. Voss Dairy	70	21.0	5.4	11.5	37.9	1917
J. F. Alberts	100	15.0	2.7	8.5	26.2	?

*Entire amount bought from numerous producers.
§1918.

to poor diagnosis or inaccurate reporting. The exact situation should be determined and the corrective measures that may be necessary should be employed. The tuberculin test of cows is an important factor in insuring a safe milk supply. It has been shown by careful study that milk containing the germs of bovine tuberculosis, is capable of transmitting tuberculosis to infants and children. The danger to adults however, is slight. Inasmuch as milk is such an essential food for infants and children, and is consumed by them in such large quantities, it is of the highest importance that the milk come from cows which are sure to be free from tuberculosis. The tuberculin test made at least once a year is necessary, in order to determine the presence of tuberculous cattle in the herd.

The maximum rating obtainable by the score used, is 100 per cent and the minimum 0 per cent. The following table classifies the dairies according to the score card rating.

TABLE No. 7.

CLASSIFICATION OF DAIRIES ACCORDING TO SCORE CARD RATINGS.

Rating	Number of Dairies	Percent of Number Inspected
Between 90-100 Percent	2	4.5%
Between 80- 90 Percent	3	6.8%
Between 70- 80 Percent	7	15.9%
Between 60- 70 Percent	18	40.9%
Between 50- 60 Percent	10	22.8%
Between 40- 50 Percent	2	4.5%
Between 30- 40 Percent	1	2.3%
Between 20-30 Percent	1	2.3%
Total number	44	100.0%
	Number	Percent
Above 60 Percent	30	68.1%
Below 60 Percent	14	31.9%

It will be seen from the table that most of the dairies visited showed a rating of from 50 to 70 per cent. Assuming 60 per cent as a minimum standard, it appears that 68 per cent of the dairies would be above the passing grade and 32 per cent would fall below. The score card used by the City Health Department is different than that employed in the survey. The city milk ordinance requires that all milk which is not pasteurized before consumption, must score higher than 70 per cent according to their score card. From the information gathered during this inspection, it is observed that a good deal of unpasteurized milk comes from dairies scoring less than 70 per cent. It is doubtful whether the use of the city score card instead of the modified North score card, would have changed the ratings of the dairies to any material degree.

It must be stated however that much good has already been accomplished in educating the farmer to produce a clean and safe milk supply. In almost every instance some attempt was made to cool the milk immediately after production. Sometimes the method employed was excellent, but in most cases the desired temperature was not attained. In about half the dairies visited, the small mouth milk pail was not used. In the remainder of the places this type of pail was employed entirely or else together with the open buckets.

A properly equipped, clean and inexpensive milk house, containing excellent facilities for washing and sterilizing bottles and for cooling milk. In the foreground is a sample of a small mouth milk pail, which is essential in producing clean milk.

The conditions found in connection with the milk supply in Oklahoma City are undoubtedly better than those existing in any other section of Oklahoma where health surveys were conducted. The introduction of the small mouth milk pail on each dairy farm is to be desired and should be brought about as soon as possible. It was found that most of the dairies have installed excellent means for the proper cleansing and sterilization of bottles and utensils.

This again shows that much good has already been accomplished in the control of the milk supply. These results are due primarily to the efforts of the City Chemist, who has worked hard to improve conditions.

Nevertheless, there are numerous shortcomings which can be eliminated by thorough and intelligent inspection together with proper education. In some cases the dairy barn immediately adjoins the horse stable without any partition separating the two, or else with very inadequate separation. This is undesirable because of the ready access which flies from the stable have to the milk pail. In some cases too, the conditions of cleanliness within the barn were unsatisfactory and often the manure pile was near-by, permitting the breeding of flies and the subsequent contamination of the milk supply. An attempt has already been made to have the privies protected by adequate screening and proper construction. In a large number of instances however, this improvement is yet to be made. Properly screened milk houses were frequent, though in some instances the screening was inadequate or entirely absent. There are several dairies which did not have a milk house.

A view of a dairy, showing the unsatisfactory and dangerous proximity of privy, horse stable and cow barn. The conditions here are ideal for the spreading of disease by flies.

Laboratory Analyses

No attempt was made to inspect those dairies which shipped milk into the city as these were too far away to permit inspection on a large scale. Samples of milk coming from these dairies were collected as they arrived in the city and were tested for temperature, specific gravity, fats and bacterial content. Several samples of milk brought to the city by the producers were also obtained . Altogether, sixty-six samples of milk were tested in this way. The accompanying table gives the result of the analysis on each sample. The tests were made by the laboratories of the Oklahoma Health Department.

No figures are given for specific gravity because those submitted seemed to be unreliable. The tests for temperature were made when the samples were collected, the test being performed on a different sample than that used for the bacteriological examination.

Analyzing the information obtained regarding the temperatures, it will be observed from table numer nine which classifies the milks according to the temperature on arrival in the city that the milks arrive in the city at unusually high temperatures.

TABLE No. 9.

CLASSIFICATION OF MILKS ACCORDING TO TEMPERATURES ON ARRIVAL IN THE CITY.

	Private Dealers	Union Dairy	Whitehouse Dairy	Southern Dairy
Above 90 degrees F. on arrival____	–	15	15	10
Between 80-90 degrees F. on arrival	0	11	9	2
Between 70-80 degrees F. on arrival	1	0	1	0
Between 60-70 degrees F. on arrival	2	0	–	–
Between 50-60 degrees F. on arrival	1	0	–	–
Between 40-50 degrees F. on arrival	2	0	–	–
Totals_________________	6	26	25	12

In fact the temperatures were most often above 80 degrees F, and in many cases were even above 90 degrees F. These temperatures approximate that of the body and favor the rapid multiplication of the bacteria to large numbers, a condition which is most undesirable. The milk brought to the city by private dealers, although lower in temperature than that shipped to the city, reaches the consumer at temperatures which are too high. Temperature is such an important factor in the production and preservation of safe milk that too much emphasis cannot be laid on this matter. It should be possible to have all milk reach the city at approximately 50 degrees F.

The bacteriological examination of the samples revealed unsatisfactory conditions. The results obtained reflect the conditions under which the milk is produced and transported. The following table classifies the milk according to bacterial content.

TABLE No. 10.

CLASSIFICATION OF MILKS ACCORDING TO BACTERIAL CONTENT.

Milks containing over 1,000,000 Bacteria per cubic centimeter	5
Milks containing 500,000-1,000,000 Bacteria per cubic centimeter	24
Milks containing 200,000- 500,000 Bacteria per cubic centimeter	18
Milks containing 100,000- 200,000 Bacteria per cupib centimeter	5
Milks containing 50,000- 100,000 Bacteria per cubic centimeter	7
Milks containing less than 50,000 Bacteria per cubic centimeter	7
Total	66

Number over 200,000 per cubic centimeter	47
Number under 200,000 per cubic centimeter	19

*Two were pasteurized milks.

In order to ascertain the condition of the milk which is brought to the city by the producers, several samples were collected and analyzed. The results are shown in the following table.

TABLE No. 11.

CLASSIFICATION OF MILKS DELIVERED TO THE CITY BY PRODUCERS, ACCORDING TO BACTERIAL CONTENT.

Bacterial Content	Number
Over 800,000 Bacteria per cc.	1
Between 600,000-700,000 Bacteria per cc.	2
Between 500,000-600,000 Bacteria per cc.	1
Between 400,000-500,000 Bacteria per cc.	1

It will be observed that none contained less than four hundred thousand bacteria per cubic centimeter and three out of five samples contained more than six hundred thousand bacteria per cubic centimeter. Since the milk is brought to the city twice a day, there seems to be no justifiable reason why fresh milk should contain such large numbers of bacteria. Milk brought to the city from farms within a radius of five miles should not contain more than one hundred thousand bacteria per cubic centimeter at the time of delivery. This standard should be maintained for milk which is not to be pasteurized. For milk which undergoes pasteurization the requirements may be more lenient, and the number of bacteria increased to three hundred thousand per cubic centimeter.

The local milk ordinance says that milk which is not pasteurized should contain not more than fifty thousand bacteria per cubic centimeter from October 1st to May 1st and not more than one hundred thousand bacteria from May 2nd to September 30th. If this standard were enforced the various milks examined would not be permitted to be sold. It should also be borne in mind that the milks examined were from the better dairies and are therefore somewhat more satisfactory than those coming from other dairies.

The local ordinance also states that milk which is to be pasteurized should not contain more than three hundred thousand bacteria per cubic centimeter from October 1st to May 1st, and not more than five hundred thousand bacteria from May 2nd to September 30th. This standard is probably too liberal for the conditions which prevail in Oklahoma City. It seems desirable to maintain the limit of three hundred thousand bacteria per cubic centimeter, for the summer period as well as for the winter period. Assuming even the most lenient standard,twenty-nine of the milks which reach the city and are pasteurized would not be permitted for use.

The following table gives the results of the fermentation test in lactose broth when 1-100 of a cubic centimeter of milk was inoculated. oculated.

TABLE No. 12.

CLASSIFICATION OF MILKS ACCORDING TO FERMENTATION IN LACTOSE BROTH, IN 1-100 OF A CUBIC CENTIMETER.

Number of Milks Examined	66	
Number showing Fermentation in 1-100 cc.	55	83.4%
Number not showing Fermentation in 1-100 cc.	11	16.6%

This test is used to indicate the presence of the Bacillus Coli which serve to indicate the presence of intestinal pollution. This pollution may come from the intestinal discharges of man, horse, cow or any other animal and represents an undesirable condition in the milk supply when present in very small quantities. Personal cleanliness on the part of the milker, clean hands, the absence of flies and manure particles and the subsequent icing of the milk supply would prevent such a condition.

The standard of fat content required by the local ordinance is 3.25 per cent. According to this standard, five of the milk samples would not pass. If the standard were raised to 3.5 per cent, a figure which is maintained in many cities throughout the country, there would be fourteen samples below the minimum. The low butter fat content indicates the practice of skimming the milk, and also to some extent the introduction of water.

The following table gives the result of the analyses of sixty-four samples of milk for fat content.

TABLE No. 13.

CLASSIFICATION OF MILKS ACCORDING TO FAT CONTENT.

Number having fats above 3.5%	50
Number having fats between 3.2-3.5%	9
Number having fats below 3.2%	5
Total number examined	64

Besides the collection of samples of milk, and the scoring of the dairies, some time was devoted to the inspection of the large distributing centers in Oklahoma City. The results of these inspections are summarized in the following table.

TABLLE No. 14.

SHOWING THE QUALITY OF MILK HANDLED BY THE LARGE DAIRIES AND ICE CREAM COMPANIES AND THE METHODS EMPLOYED.

Distributor	Number of Producers	Amount Milk Handled in Gals. per Day	Furthest Distance from which Milk is Delivered	Pasteurized	Bottles Effectively washed and sterilized	Milk Room Effectively Screened
Southern Dairy	8	200	20 Miles	No	Yes	Yes
Union Dairy	50	800	24 Miles	Yes	Yes	Yes
Whitehouse Dairy	50	600	16 Miles	Yes	No	No
Crystal Ice Cream Co.	63	850	15 Miles	Yes		Yes
Steffens Ice Cream Co.	150	1250	25 Miles	Yes		No

It is obvious from this table that most of the city's milk supply is handled through these large dairies. Most of this milk is pasteurized, though in one instance this treatment was not employed in spite of the fact that a pasteurizing machine had been installed. It is probable that by this time even this supply is pasteurized.

Distributing Dairies

The methods employed in cleaning and sterilizing the bottles and utensils were given careful consideration. In at least two cases the bottles were not effectively washed and sterilized and these bottles were found in dirty condition after they were supposed to have been cleansed and sterilized. In two other of the large dairies however, the bottles were thoroughly washed in hot water containing washing powder, scrubbed with the aid of a brush, and then sterilized. The milk cans were always properly washed, and then inverted over a steam jet and sterilized. The practice of sterilizing cans and bottles by means of a commercial powder, supposed to be a compound of chlorine should be discouraged. This practice, which was found to be in vogue at one of the large dairies, is undesirable, because the cans are usually returned to the farmer with small amounts of the germicide in the can, and this aids materially in preserving the milk. The substitution of such germicides for the use of hot water or steam, together with washing powder, tends to make milk producers and dairymen less careful in the proper cleansing of the utensils. The introduction of such commercial products in the dairy business should be discouraged in every way by health authorities.

In each of these large dairies, except for the one noted above, the milk is pasteurized and cooled to a fairly low temperature. As a rule deliveries are made twice a day.

In three plants the milk rooms were found to be effectively screened and comparatively few flies were present; in two cases where the screening was inadequate, the flies in the room were very numerous. It is urged that every milk room be entirely screened in order to diminish the danger from flies.

Two of the five places visited, manufactured ice cream on a large scale. These plants are constructed in a satisfactory manner and have cement floors with drains leading to the sewer. By the abundant use of water and steam the places are kept very clean.

With reference to the process of pasteurizing, there is serious doubt as to whether the proper temperature and the proper holding period are always employed. In no case was a recording thermometer used and in some cases no thermometer of any kind was employed. To insure efficient pasteurization, it would be distinctly advisable to install a recording thermometer in every pasteurizing plant so that the temperature and time at which the milk is pasteurized could be automatically recorded. These records could then be examined by the milk inspector who would ascertain whether the proper methods were employed. This is an exceedingly significant matter, because if pasteurization is not carried out in the proper manner, the milk will receive very little benefit by such treatment. Yet the people would have a false sense of security because the milk was being sold as "pasteurized" milk.

An important matter in connection with the handling of all foods is the question of adequate and proper toilet and washing facilities. Soap, running water, and individual towels should always be provided in order that the employees may keep their hands clean. A typhoid carrier who is not careful in his personal habits may succeed in infecting the ice cream supply or the milk supply and in that way be the cause of a serious epidemic of typhoid fever.

In the case of the Crystal Ice Cream Company the toilets are located in the alley adjoining the plant. A number of other toilets which are used by near residents adjoin the former. Soap and water are provided in the toilet room of the ice cream company but towels are absent. The alley toilets are subject to fly nuisance, even though they are connected to the sewer. Fecal material frequently adheres to the hoppers and attracts flies as readily as the material in the open privy. The toilets were not screened. The toilets of the Steffens Ice Cream Company are indoors and are clean and light. A sign is posted in the toilets directing the employees to wash their hands. Soap and running water are provided nearby and it is said that sugar sacks are used for individual towels.

From the above discussion of the inspections and analyses of the milk supply, it will be observed that many defects exist which prevent the supply from being satisfactory. Our knowledge of the milk supplies today convinces us that expensive barns and costly equipment are not necessary for the production of a clean and safe milk supply. On the other hand, it is well known that clean milkers, clean hands, clean cows, clean barns, and a thoroughly screened milk house, the use of small mouth milk pails, rapid and adequate cooling, the use of an abundant supply of hot water or steam for sterilizing the utensils and bottles and the frequent removal of manure, are all that are required to produce a safe and clean supply under most conditions.

It is also of the highest importance to be sure that those persons who handle the milk or utensils are free from disease. This is called for by the local ordinance, but the improper execution of the law makes this important regulation of little value. The ordinance requires that all food handlers obtain a certificate of health from the City Physician before being permitted to handle foods. The actual method of examination employed is unfortunately not physical, nor medical, but is entirely verbal. The applicant is asked his name, age, residence, by whom he is employed and the period of employment. He is then asked the condition of his health and whether he or any member of his family has any contagious disease, and as is to be expected he replies that he is well and is not infected with any communicable disease. Upon answering these questions the applicant is granted a certificate of health by the City Physician.

This method of examination is of no value and should be substituted by one in which the individual would receive a careful physical examination. He should submit samples of sputum, blood and feces for examination in order to detect the signs of any contagious disease such as tuberculosis, typhoid fever and syphilis. In this way it will be possible to prevent persons who are carriers of disease or who are ill with disease, from handling food products.

A cheap barn having a concrete floor, which is kept unusually clean. Milk having a low bacterial count is produced under these conditions. Expensive barns are not essential for the production of clean milk.

One of the important conditions in connection with the control of the milk supply is the frequent inspection and scoring of the dairies that supply milk to the city. Not only should those dairies which are in or near the city be inspected but those which are further away should also be included. At the present time the city employs a milk inspector to carry on this work. At the time this study was being made, the inspector had been employed for several months, but had not submitted a single report on the inspection of the dairies. Unfortunately the milk inspector is not trained for the work and it is therefore impossible to expect that this work will be carried on in a satisfactory way. Not only should the milk inspector be required to visit and score the dairies, but he should also collect samples of milk as they arrive in the city and submit them to chemical and bacteriological analysis. In this way the work of the laboratory would supplement the inspections in the field. A complete history of the supply would then be available.

Nor should the work of the milk inspector end with a critical examination during his inspection. He should be constructive and attempt to improve the existing conditions by the proper education and encouragement of the farmer. For this purpose it is necessary to have an individual who not only appreciates the relationship between the milk supply and the public health, but one who could gain the confidence and good will of the farmers in his efforts to enlighten them in the correct methods of milk production. The present milk inspector is incompetent for such a task and it is urged therefore that he be substituted by a trained man who will be able to carry on this work effectively and wisely. In that way alone will it be possible to improve the quality of the milk supply which is reaching the city at the present time.

Ultimately, the city will have to insist on the pasteurization of the entire supply which reaches the city unless the conditions under which the milk is produced are highly satisfactory and unless the milk handlers have all been thoroughly examined to ascertain whether they are free from disease. Effective pasteurization is such a safeguard to the community that its use should be encouraged in every way. Babies depend upon the milk supply for their welfare, and will undoubtedly thrive better on a pasteurized milk than on milk which is not pasteurized, providing both milks are of the same type. Pasteurization should not be permitted to take the place of cleanliness. It is necessary to obtain a clean milk whether the milk is to be pasteurized or not, but in order to safeguard the supply pasteurization should be practiced.

The milk which reaches the city is not graded. All milk is considered alike except in one or two instances where unusual precautions are taken to produce clean milk. Such milk is usually sold at a higher price than the regular supply. Nor is there any certified milk sold in the city. There are doubtless hundreds of families who would be willing and glad to pay the price for certified milk in order to secure clean and safe milk for the babies and children. To introduce certified milk in the city would not only prove a wise public health measure, but would doubtless also prove successful as a business undertaking.

A condition which is prevalent to a large degree is brought about by the presence of numerous one and two cow dairies within the city. These dairies because of their size are not classed as dairies under the city regulations, and consequently are not subject to inspection. Many residents keep cows in order to obtain fresh milk for their families. Frequently some of the surplus is sold to their neighbors. As a rule the conditions of production are unsatisfactory, and nuisances are created in the neighborhood on account of the accumulation of cow dung and the subsequent breeding of flies.

In order to protect the community and safeguard those that utilize the milk obtained from these private sources, these dairies should be required to satisfy the regulations of the city pertaining to the production of such milk by large dairies. Permission to maintain cows within the city limits should not be granted until the city inspector is satisfied that the requirements of the Health Department are met.

Summary

The milk supply of the city comes from a short distance. The milk in most cases is brought to the city twice a day. Forty-four dairies were scored, and of these 31 per cent scored less than 60 per cent. Examinations were made for butter fat content, for specific gravity, for temperature and bacteria. The bacterial content was unusually high in most cases. Most often the milk reaches the city at unusually high temperatures. Although much has been done on the farms to improve the condition under which milk is produced and handled, much yet remains to be done. There is also evidence of skimming and watering. Pasteurization is widely practiced but it is not universal, nor is it under scientific control. The distributing dairies and ice cream companies within the city were also inspected. Many one and two cow dairies located in the city create a special problem. Those that handle milk and other foods are not required to undergo a thorough medical examination in order to determine whether they are free from disease.

Recommendations

1. That a well trained, able and efficient milk inspector be employed to supervise the milk supply and to educate the farmers, dealers and others in the production of a good, clean, safe milk.

2. That all food handlers be required to submit a certificate of health showing that they are known to be free from disease as a result of a thorough medical examination.

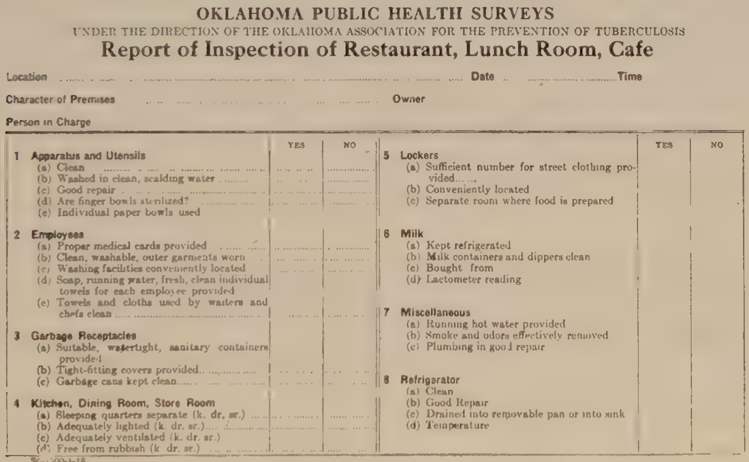
3. That pasteurization by the holding method be required of all milk that is sold in the city, unless it meets the bacteriological requirements outlined in the text, and that all pasteurizing plants employ recording thermometers in order to show the temperature and period that are used.

4. That all one and two cow dairies located in the city be licensed and that they be inspected and controlled like the other dairies.

VI.

Inspection of Restaurants and Food Stores

ANOTHER feature of the survey was the inspection of food stores, lunch rooms and restaurants. For this purpose, aid was obtained from the Oklahoma State Department of Health. Two inspectors were assigned to the work, and in all 74 lunch rooms and restaurants were visited. The number of food stores inspected is so small that the results are omitted since no justifiable conclusions could be drawn from the meager data at hand. The information obtained concerning the lunch rooms and restaurants is however more adequate. The card which was used in the inspection was essentially the same as that employed by the New York City Health Department in the inspections conducted in that city.



OKLAHOMA PUBLIC HEALTH SURVEYS
UNDER THE DIRECTION OF THE OKLAHOMA ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS
Report of Inspection of Restaurant, Lunch Room, Cafe

Location .... **Date** ....**Time**
Character of Premises .... **Owner**
Person in Charge

	YES	NO
1 Apparatus and Utensils		
(a) Clean		
(b) Washed in clean, scalding water		
(c) Good repair		
(d) Are finger bowls sterilized?		
(e) Individual paper bowls used		
2 Employees		
(a) Proper medical cards provided		
(b) Clean, washable, outer garments worn		
(c) Washing facilities conveniently located		
(d) Soap, running water, fresh, clean individual towels for each employee provided		
(e) Towels and cloths used by waiters and chefs clean		
3 Garbage Receptacles		
(a) Suitable, watertight, sanitary containers provided		
(b) Tight-fitting covers provided		
(c) Garbage cans kept clean		
4 Kitchen, Dining Room, Store Room		
(a) Sleeping quarters separate (k. dr, sr.)		
(b) Adequately lighted (k. dr. sr.)		
(c) Adequately ventilated (k. dr. sr.)		
(d) Free from rubbish (k dr. sr.)		

	YES	NO
5 Lockers		
(a) Sufficient number for street clothing provided		
(b) Conveniently located		
(c) Separate room where food is prepared		
6 Milk		
(a) Kept refrigerated		
(b) Milk containers and dippers clean		
(c) Bought from		
(d) Lactometer reading		
7 Miscellaneous		
(a) Running hot water provided		
(b) Smoke and odors effectively removed		
(c) Plumbing in good repair		
8 Refrigarator		
(a) Clean		
(b) Good Repair		
(c) Drained into removable pan or into sink		
(d) Temperature		

86-1500-4-18

One side of form used for inspection of restaurants.

It will be observed from the table, under the head apparatus and utensils, that one of the chief defects observed was the inability to furnish clean dishes which have been washed in clean scalding water. Frequently the dishes are washed in a tub of water which soon becomes very dirty, as the water is changed infrequently. Nor is the water that is employed usually hot enough to destroy the germs that may have been left behind on the dishes, from food that has been partially eaten. Nor is it sufficiently warm to quickly remove the grease which is always present on most dishes after they have been used for serving food. Sometimes the dishes are washed in only one tub of water without an additional rinsing in another water. In some cases the dishes are washed in regular machines especially provided for that purpose. In such cases a fresh supply of water continually comes in contact with the soiled dishes. Where this is practiced the water employed is usually hot and besides has some alkali dissolved in it, to render the removal of grease more easy. This is the most commendable procedure because it enables each dish to be washed in fresh clean water. In that way the possibility of contaminating or infecting the dishes from water which has previously been used is eliminated. If this system is not provided, it should be required that the water be changed at frequent intervals, particularly during the rush hours, so as to provide fresh water to render the dishes clean.

Where finger bowls are used they are never sterilized. A finger bowl represents a splendid means of transmitting disease. After an individual has used the finger bowl and the water has been emptied there remains behind a small portion of the water which goes to infect the fresh water which is added, when the finger bowl is to be used again by another patron. It is usually the custom for individuals not only to moisten the finger tips, but also to wash the lips with the same water, thus conveying to the lips any possible infection which may be present. It is obvious that direct contact with the germs left behind by the previous patron is established in this way. This is most undesirable. Where finger bowls are used, only individual bowls should be employed. These should be preferably of paper so that they may be destroyed after being used once.

The employees connected with the handling of food in restaurants and lunch rooms are not required to undergo a medical examination to ascertain whether they are physically fit to handle foods or not. Yet this is one of the most important factors in connection with a safe food supply. An individual who is a typhoid carrier or a carrier of almost any other disease, may succeed in transmitting the infection to others if he serves as a cook or waiter. It is therefore important to determine whether an individual is free from disease before he is permitted to serve as a food handler. This can only be determined by a thorough medical examination including the laboratory examination of specimens of sputum, excreta and blood. An individual who is pronounced to be free from disease should then be served with a certificate signifying that he has been medically examined and found to be free from disease and granting him permission to serve as a food handler. All others should be prevented from acting in such a capacity. This should be one of the normal functions of a properly organized health department.

In this same connection it is important to emphasize the necessity of providing adequate washing facilities for the employees. The importance of clean hands in the handling of foods hardly needs to be emphasized. In order to enable the workers to practice cleanliness or the proper principles of personal hygiene, proper and adequate facilities must be provided for that purpose. Wash basins should be adequate in number and should be properly located. They should be located in connection with the toilet facilities. Soap and running warm water should also be provided and above all, it is essential that iindividual towels, either of paper or of cloth should be provided. If the individual towel is not used, almost the entire benefit to be derived from good washing facilities is lost, as the hands may become more seriously infected than they may have been before. It will be observed from the table how infrequent is the practice of furnishing individual towels together with proper washing facilities which of course should include soap.

Clean washable outer garments were not worn in one-third of places visited.

The care of the garbage presents another problem which is usually poorly solved. It is unusual to find suitable water tight receptacles together with tight fitting covers. The cover is usually entire absent, not only thus exposing the garbage but attracting numerous flies. This of course increases the opportunities for contaminating the food. It is also unusual to find garbage cans which are kept clean. The lunch rooms are usually free from rubbish although in some cases this is not so. This situation can only be remedied by frequent inspections, supervision and education.

The conditions found in the kitchen, dining room and store room, with relation to the use of these places for sleeping quarters are satisfactory. If sleeping quarters are present at all they are separated from the places where food is prepared, served or stored. Usually however, sleeping quarters are not maintained in connection with the lunch rooms. With regard to light the lunch rooms are as a rule found to be adequately lighted. Usually they are adequately ventilated too. However, the question of ventilation presents a difficult problem in some cases. This is particularly true in connection with the removal of the excessive heat generated in the kitchen. Men are required to work under unusually high temperatures when adequate facilities for the removal of excess heat by exhaust fans are not provided. In such case as it is also unusual to find that the gases or odors resulting from cooking are properly removed, thereby permitting them to pervade the kitchen and sometimes the dining room too.

The clothing of the employees is sometimes stored in the toilet rooms, sometimes in the kitchen and sometimes in the store rooms Usually hooks or nails are provided on which the clothing may be hung during the working time. For the greater convenience of the employees and in order to diminish the possibility of contaminating the food from the clothing it would be desirable to furnish adequate and proper locker facilities. This would also avoid the possibility of theft.

Running hot water is supplied in most of the restaurants particularly in connection with the dish washing apparatus, but in some cases this is not done. This naturally makes the problem of sanitary washing of dishes more acute and more difficult.

The plumbing is usually found to be in good repair, although in some instances such was not the case.

The refrigerators are fairly clean in most cases. However, it is rare to find a refrigerator which is maintained at a sufficiently low temperature. Usually the temperature does not fall below 60 degrees F. and sometimes is as high as 80 degrees F. The temperature of a refrigerator should be 40 degrees F. or below.

The screening of the doors and windows is satisfactory. Most doors are of the self closing type, and always kept closed. This makes it possible for the kitchen and dining room to be free from an excessive number of flies.

Show cases, counters and shelves are usually clean and in good repair, but it is frequently found that certain foods particularly pies and pastries are exposed to dust, flies and other contamination. Instead of being adequately protected in a thoroughly screened or closed case, they are completely exposed or only partially protected. This evil practice can only be remedied by frequent inspections and education.

The milk is always kept in the refrigerator and the milk container and dippers are usually clean.

The toilets were found to be clean, well lighted, well ventilated and properly enclosed. In every case they were found to be located conveniently. Except in one case they were found to be in good repair. It would be desirable however, to post signs in the toilets instructing the employees to wash their hands after using the toilet. Such instructions were never posted in any case.

Inspections were also made of the yards and alleys on which the lunch rooms were located in order to observe whether they were clean and free of rubbish. In many cases it was found that these places were maintained in a very unsatisfactory way. Rubbish was stored in large amounts, garbage was exposed to flies and unsatisfactory condition prevailed in general.

Summary

Seventy four lunch rooms and restaurants were inspected. For this purpose a special form, almost identical with that used by the New York City Health Department was employed. The following evils were found frequently. The dishes are usually improperly washed. Finger bowls are never sterilized. Food handlers are not medically examined to learn whether they are free from disease. Adequate and proper washing facilities are usually absent, although toilets are as a rule clean and convenient. Garbage is not stored in water tight, covered cans. The ventilation in the kitchens particularly is usually poor. Clothing lockers are not provided. Often hot running water is not available. Refrigerators are frequently unclean and rarely cold enough. Some places are not screened adequately. Often pies and pastry are exposed to contamination from dust and flies.

Recommendations

1. That all food stores be examined more frequently in order that the defects brought out by the inspections may be remedied.

2. That all food handlers be required to show a certificate of health obtained as a result of a thorough medical examination.

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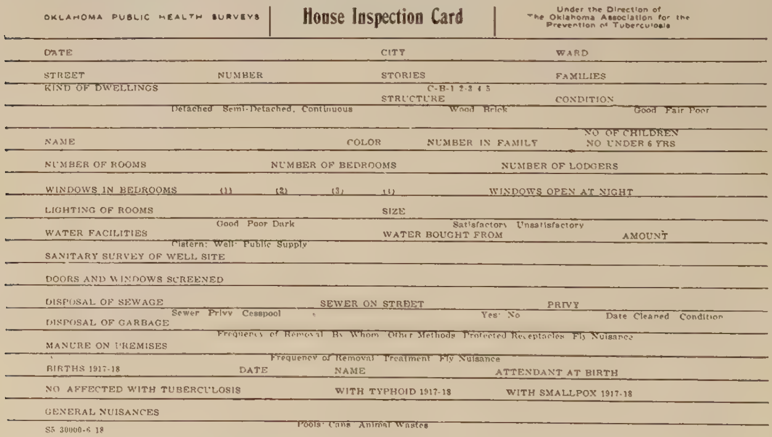
VII.

Housing

PART of the survey was to conduct an intensive housing investigation of the city. For this purpose a housing committee was appointed consisting of four or five prominent, enthusiastic, civic spirited women. The city was divided into districts and over each a captain was placed in charge. The districts were then further divided into precincts, each of which was placed in charge of a lieutenant. The preliminary organization having been completed, a meeting was called by the Central Housing Committee of all the lieutenants and captains in order that they might receive instructions for the work from the director of the survey. At this meeting the form card which was used for the collection of the housing data, was explained and some of the difficulties that would probably be met were pointed out. A solution in each case was suggested. The workers were encouraged to ask questions in order to bring out any point which may not have been made clear. After this meeting the housing survey began.



OKLAHOMA PUBLIC HEALTH SURVEYS | **House Inspection Card** | Under the Direction of The Oklahoma Association for the Prevention of Tuberculosis

DATE CITY WARD

STREET NUMBER STORIES FAMILIES

KIND OF DWELLINGS C-B-1 2-3 4 5 STRUCTURE CONDITION

Detached Semi-Detached, Continuous Wood Brick Good Fair Poor

NAME COLOR NUMBER IN FAMILY NO OF CHILDREN NO UNDER 6 YRS

NUMBER OF ROOMS NUMBER OF BEDROOMS NUMBER OF LODGERS

WINDOWS IN BEDROOMS (1) (2) (3) (4) WINDOWS OPEN AT NIGHT

LIGHTING OF ROOMS SIZE

Good Poor Dark Satisfactory Unsatisfactory

WATER FACILITIES WATER BOUGHT FROM AMOUNT

Cistern: Well: Public Supply

SANITARY SURVEY OF WELL SITE

DOORS AND WINDOWS SCREENED

DISPOSAL OF SEWAGE SEWER ON STREET PRIVY

Sewer Privy Cesspool Yes: No Date Cleaned Condition

DISPOSAL OF GARBAGE

Frequency of Removal By Whom Other Methods Protected Receptacles Fly Nuisance

MANURE ON PREMISES

Frequency of Removal Treatment Fly Nuisance

BIRTHS 1917-18 DATE NAME ATTENDANT AT BIRTH

NO AFFECTED WITH TUBERCULOSIS WITH TYPHOID 1917-18 WITH SMALLPOX 1917-18

GENERAL NUISANCES

Pools: Cans Animal Wastes

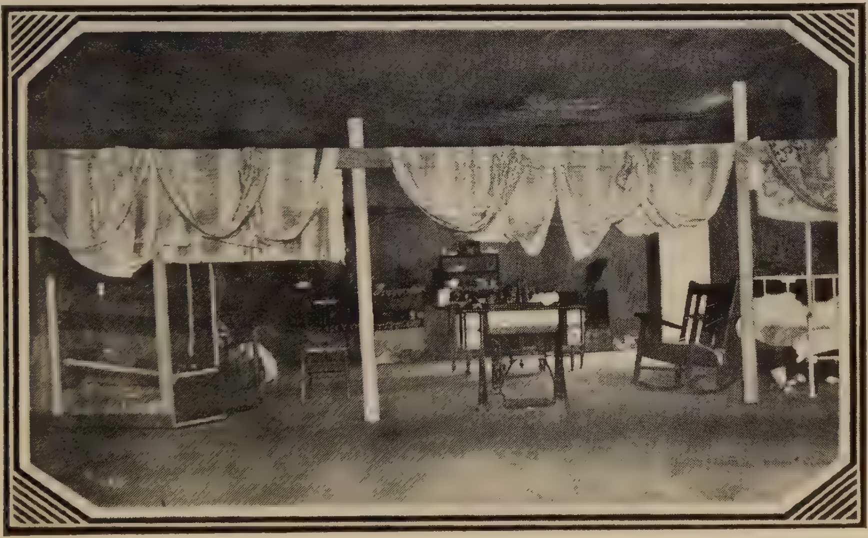
S5 30000-6 18

Reproduction of House Inspection Card.

The form card which was used for the collection of the housing information was especially prepared for the survey.

General

The housing situation in Oklahoma City may be said to be unusually good. The city is spread over a large area, and the detached dwelling is very common. As a rule plenty of light and fresh air are available in the homes and there is almost always a back yard or garden and a well kept lawn. Most of the homes in the city are of good construction and present a fine appearance, and the variety of construction is very pleasing to the eye. Oklahoma City may well be proud of this, but care must be taken not to permit the present high standards to deteriorate. There are several sections of the city where the housing conditions are unsatisfactory and even extremely poor. These places are located mostly in the southeast part of the city and in that section of the city known as Packingtown. Where unsatisfactory conditions exist, it is desirable to bring about an early remedy. The situation can be helped very much by the enactment of proper legislation and the carrying on of regular, intelligent housing inspections. An attempt should be made to do away with all privies. Where there is a sewer on the street, the house should be connected with the sewer at once. Where there is no sewer on the street, the city sewerage system should be extended to include this area. Privies are a potential source of danger to the community and should be eliminated wherever possible.



Interior view of Packingtown room, where three families live, the only privacy afforded being transparent curtains.

An adequate supply of water should be furnished to every home, and the city supply made safe so that it can be used for drinking purposes.

The dark room dwelling should be prohibited and efforts made to prevent over-crowding which exists in several quarters of the city.

In several houses observed by the investigators, a large room was divided by a thin, transparent curtain serving as a partition and this room was occupied by two or three families. Under such conditions, privacy is impossible and modesty becomes greatly diminished. Such conditions are very unsatisfactory and should be prohibited. Very often, dilapidated one story shacks were found in the poorer sections of the city. Here the number of children was large and the sanitary conveniences were of the poorest type. Usually one privy served for a large number of persons, and water had to be hauled from the central well which supplied numerous families. The ceilings in these house were low, and the size of the rooms unsatisfactory. Since cooking had to be done in these rooms, they were nearly always over heated. Such conditions do not make for good health.

A fine row of beautiful homes so typical of Oklahoma City.

Several cases were found where the houses contained many rooms, but they were used by numerous families for light housekeeping. In these houses overcrowding was prevalent and the water and toilet facilities were inadequate. In one large tenement house located on East Grand Avenue, only one toilet was provided for all the occupants and this toilet was out of order. Instead of repairing the toilet, it was being used as a store room for all kinds of rubbish. As a result, other means of disposal of the excreta had to be employed. Since privies were not provided, it was customary to dispose of the human wastes on the surface of the ground. Nor was this large house supplied with running water for each family. Instead there was only one hydrant located in the yard from which each family had to obtain its water.

Frequently where wells were in use there were open privies or manure piles nearby. Thus a situation was created which favored the pollution of the water supply. Photographs showing these conditions were taken, and are reproduced in this chapter.

In one of the so-called hotels in Packingtown that were visited, the beds were placed side by side with very little space between them. There were no drinking water or washing facilities present and the place was unusually dirty.

In the southern part of the city there were several streets with outside flush toilets. These toilets were located on the alley at the rear of the house. The kind of hopper used is such as to permit the excreta to remain behind even though the toilet is flushed. As a result, flies are attracted, and in reality such a water closet becomes an open privy. The toilet facilities should be installed in the homes and in that way these vestiges of the old time privy which still exist would be eliminated.

A number of the more attractive homes were inspected and found to be entirely satisfactory. A representative number of these homes was photographed and these are also reproduced in this chapter. These do not represent by any means the best homes to be found in the city, but are typical of the very large number of fine and comfortable residences which make Oklahoma City one of the most beautiful and homelike communities in the country.

Construction of Homes

Oklahoma City is divided into four wards. In all 9,277 houses were inspected during the survey. This number represents about 70 percent of the homes in the city.

The first table shows the distribution of the houses by wards according to the height, and also according to the number of families occupying each house. It will be observed from this table that the one story house is the prevailing type, not only in the city as a whole, but also in each ward.

TABLE No. 16.

SHOWING THE HEIGHT OF DWELLINGS AND THE NUMBER OF FAMILIES PER HOUSE—BY WARDS.

Ward	Total	STORIES					NO. OF FAMILIES PER HOUSE									
		1	2	3	4	No. rept.	1	2	3	4	5	6	7	8-11	12-16	No. rept.
1	2706	1488	1101	76	4	37	2427	162	16	26	2	1	7	1	1	63
2	2080	1065	908	39	_	68	1599	138	74	44	--	26	--	--	--	199
3	1944	1160	631	14	1	138	1353	257	62	61	6	5	3	9	2	186
4	2547	1877	468	31	2	169	1861	284	48	44	14	15	13	6	10	252
Total	9277	5590	3108	160	7	412	7240	841	200	175	22	47	23	16	13	700

There is also a considerable number of houses that are two stories in height. The number of houses higher than two stories are very few. These figures tell a very interesting story in that they show that the tenement house has not yet invaded Oklahoma City to any extent. For the best interests of the future of the city it is hoped that this condition will continue. A tenement house is defined as one that has three or more families. The table demonstrates that the large majority of houses are occupied by one family only and that a much smaller number is occupied by two or more families. The longer the city can prevent the invasion of the tenement house the more satisfactory will the housing situation be, and the easier will it be to correct the unsatisfactory housing conditions which exist. If any serious housing evils exist in Oklahoma City, they

A very large lodging house in Packingtown, offering facilities for light housekeeping. Very serious housing evils exist here.

TABLE No. 17.

SHOWING THE KIND OF DWELLING, THE MATERIAL USED IN CONSTRUCTION AND THE CONDITION—BY WARDS.

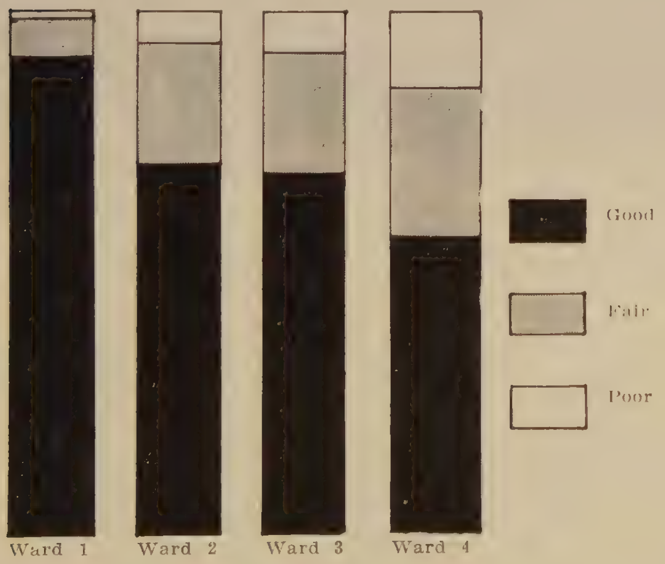
Ward	Total	KIND OF DWELLING				STRUCTURE			CONDITION			
		Detached	Semi-Detached	Continuous	No Report	Wood	Brick	No report	Good	Fair	Poor	No report
1	2706	2110	95	214	287	2290	256	160	2282	200	25	199
2	2080	650	179	577	674	1765	196	119	1230	398	98	354
3	1944	1003	177	376	388	1635	155	154	1233	409	142	160
4	2547	1748	112	271	416	2238	123	186	1320	641	328	258
Total	9277	5511	563	1438	1765	7928	730	619	6065	1648	593	971

are due only in a very small way to the tenement house. Instead they are the result of conditions arising from poverty, ignorance and the lack of cleanliness. Even in those parts of the city where housing conditions are poorest, the tenement house is usually absent.

Table No. 17 shows that by far the majority of homes are detached, that is, that there is no dwelling on either side, in direct contact with it. This is a very desirable condition because it permits each family to have access to plenty of fresh air and sunshine. The number of semi-detached houses is comparatively few. The semi-detached dwelling is one that is occupied by two families. The house

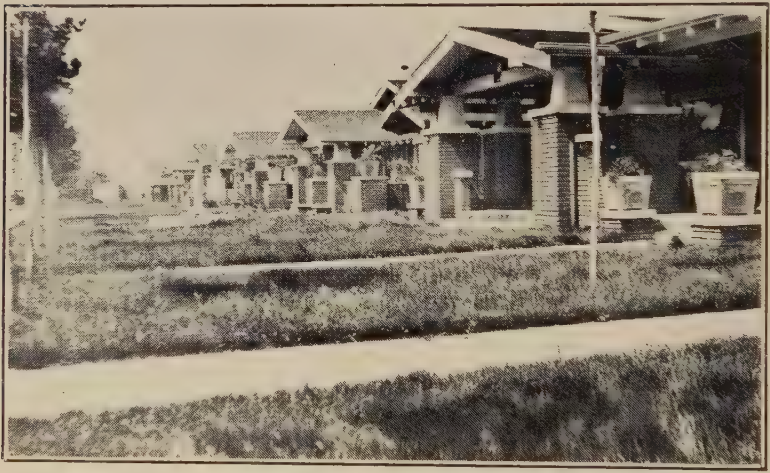
CHART A.

SHOWING CONDITIONS OF DWELLINGS BY WARDS.



is divided longitudinally into two halves and each half is occupied by a separate family. Each family has a separate entrance and separate toilet and water facilities. The house as a unit is free on both sides, in a similar way to the single detached house.

The number of continuous dwellings is surprisingly large. In the second ward particularly, there are almost as many continuous dwellings as there are detached houses. A house built on the continuous plan does not offer adequate lighting facilities or proper ventilation. In communities where land is available and where the population is not too large, the continuous houses should be avoided. The number of continuous houses in the third ward is also too large. It would be distinctly advisable therefore to make a special effort to prevent the construction of new continuous houses in either of these two wards.



Typical Bungalows in Oklahoma City.

Most of the houses in every ward in the city it will be observed from the table are made of wood. Although made of wood, they are as a rule in a very satisfactory condition and represent no particular menace to the health or safety of the occupants. Except in the very poor sections of the city, the houses were found to be of varying design, thus avoiding the monotonous appearance of rows of dwellings all of which have the same design.

A further examination of the table reveals the fact that most of the houses inspected were considered to be in good condition. In the third and fourth wards however, there were a large number of houses which were rated poor and fair. The better and more expensive type of homes were found in ward one and of course these homes were in very good condition. While the large majority of homes were cared for satisfactorily, attention should be directed to those dwellings which were rated poor or fair. These should eventually be replaced by homes of the more satisfactory type.

TABLE No. 18.
SHOWING THE NUMBER OF PERSONS PER FAMILY—BY WARDS.

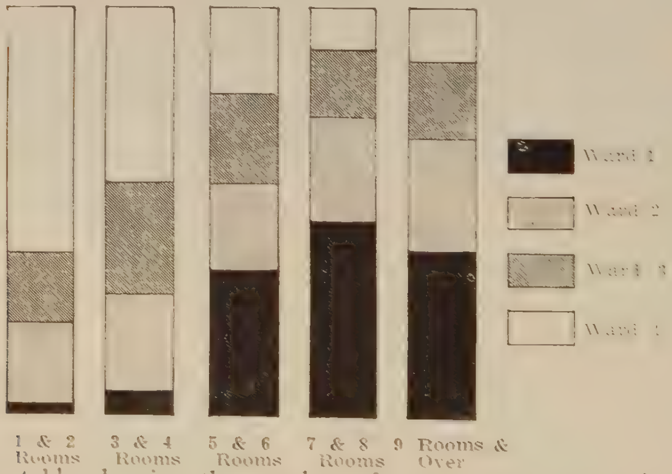
No of persons per family	Total	WARD			
		1	2	3	4
1	341	47	76	87	131
2	2211	553	597	478	583
3	2321	709	527	521	564
4	1877	592	382	388	585
5	1176	360	245	238	333
6	510	56	128	129	197
7	306	73	68	44	121
8	144	32	28	34	50
9	64	18	16	----	30
10	51	8	3	25	15
11	13	4	6	----	3
12	8	1	2	----	5
13	2	1	1	----	----
14	----	----	----	----	----
15 and over	2	1	1	----	----
No report	251	251	----	----	----
Total	9277	2706	2080	1944	2547

TABLE No. 19.
SHOWING THE NUMBER OF ROOMS PER HOUSE—BY WARDS.

No. of Rooms	Total	WARD			
		1	2	3	4
1	129	3	11	18	97
2	507	12	114	95	286
3	989	35	262	263	429
4	1550	116	345	404	685
5	2366	755	480	550	581
6	1514	636	350	284	244
7	643	286	182	102	73
8	731	370	172	119	70
9	210	99	64	38	9
10	186	83	52	30	21
11	50	19	15	13	3
12	71	24	11	10	26
13	14	3	1	4	6
14	20	6	3	2	9
15 and over	46	8	18	12	8
No report	251	251	----	----	----
Total	9277	2706	2080	1944	2547

The combination of these two tables will indicate to a certain degree the state of overcrowding that exists. This is brought out more clearly in some of the tables which follow later, which show the relationship in one table between the size of the family and the number of rooms occupied. In Ward 1, the predominant family consists of three persons; in Ward 2 the most usual number in the family is two persons; in Ward 3 the most usual number is three persons, and in Ward 4 the family consisting of two persons is the most frequent. The families usually have from two to five members. A further examination of the table will show that the larger families occur most frequently in Ward 4. This would be expected however since Ward 4 is the poorest section of the city. It will be noted that 341 houses were found in which there was only one member in the family. Of this number, 131 were in Ward 4. These individuals usually live in small shacks where the housing conditions are most unsatisfactory.

Chart B.
SHOWING THE NUMBER OF ROOMS PER HOUSE ACCORDING TO WARDS.



The table showing the number of rooms per house brings out some very interesting facts. It will be observed that the number of houses having 1, 2 or 3 rooms is very small in Ward 1, and very large in Ward 4. For example: There were only three, one room houses in Ward 1 and ninety-seven one room houses in Ward 4. There were 12 two rooms houses in Ward 1 and 286 two room houses in Ward 4. There were 35 three room houses in Ward 1 and 429 three room houses in Ward 4. The number of dwellings having 5 or 6 or more rooms are seen more frequently in Ward 1 than in any other ward. These larger houses are found least often in Ward 4. There were 370 eight room houses in Ward 1 and only 70 houses of the same size in Ward 4. There were 210 nine room houses in Ward 1 and only 9 such houses in Ward 4. This indicates the financial status of the people in the different wards—the larger the house, the better is the financial condition of the people.

The majority of the houses in Ward 2 have from 4 to 6 rooms, although there are many that have 7 and 8 rooms. In Ward 3 the houses usually have from three to five rooms with a number of houses containing seven and eight rooms. In Ward 4 the houses have from 2 to 6 rooms, the four room house predominating. There are comparatively few houses in this ward that have more than 6 rooms.

From the table showing the relationship between the size of the family and the number of rooms occupied in Ward 1, it will be observed that a family of 2 usually occupies a 5 room dwelling; a family of 3 occupies a 5 room dwelling, and families of 4 occupy 5 or 6 room houses as do also families of 5. Where there were 6 members in the family, the 6, 7 and 8 room houses were used most frequently. A family of 7 occupies a dwelling of 5, 6, 7 and 8 rooms and the family of 8 occupies a dwelling of 8 rooms. This last group represents the poorer families in the ward living in the poorer houses whereas the families referred to earlier are usually found to occupy dwellings sufficiently large for the size of the family.

TABLE No. 21.

HOWING THE RELATIONSHIP OF THE NUMBER PER FAMILY AND THE NUMBER OF ROOMS OCCUPIED IN WARD 2.

o. in amily	NUMBER OF ROOMS																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	24	
1	2	8	17	14	13	9	2	3	4	--	1	1	-	-	-	1	1	-	-	76
2	4	58	95	137	122	68	45	33	15	12	2	1	1	1	2	1	-	-	-	59
3	2	30	70	73	139	95	45	44	13	7	1	4	-	1	2	-	-	1	-	527
4	2	11	40	53	86	80	32	37	12	19	4	2	-	1	1	-	-	-	2	382
5	--	5	22	38	65	46	25	23	9	7	3	1	-	-	-	-	-	1	-	245
6	1	1	5	19	25	29	18	21	3	3	1	--	-	-	1	-	1	-	-	128
7	--	1	6	7	14	14	11	8	2	2	2	1	-	-	-	-	-	-	-	68
8	--	---	1	1	8	7	2	1	4	1	--	--	-	-	1	-	-	-	2	28
9	--	---	4	2	2	2	2	1	1	1	1	--	-	-	-	-	-	-	-	16
10	--	---	---	1	---	---	---	---	--	--	--	1	-	-	-	-	-	-	1	3
11	--	---	1	---	5	---	---	---	--	--	--	--	-	-	-	-	-	-	-	6
12	--	---	---	---	1	---	---	---	1	--	--	--	-	-	-	-	-	-	-	2
13	--	---	---	---	---	---	---	1	--	--	--	--	-	-	-	-	-	-	-	1
15	--	---	1	---	---	---	---	---	--	--	--	--	-	-	-	-	-	-	-	
otal	11	114	262	345	480	350	182	172	64	52	15	11	1	3	7	2	2	2	5	208

TABLE No. 20.

SHOWING THE RELATIONSHIP OF THE NUMBER PER FAMILY AND THE NUMBER OF ROOMS OCCUPIED IN WARD 1.

No. in	NUMBER OF ROOMS																			
family	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	
1	3	1	1	5	10	3	10	6	4	2	--	1	-	1	-	-	--	-	-	47
2	-	3	7	33	224	131	52	65	14	11	4	4	-	3	-	-	--	-	2	553
3	-	1	12	42	234	194	78	91	21	22	8	4	-	1	-	-	--	1	-	709
4	-	2	12	16	173	165	70	98	29	16	3	4	1	-	1	-	--	-	2	592
5	-	2	1	11	87	95	45	66	24	16	3	7	2	-	1	-	--	-	-	360
6	-	--	1	2	4	18	11	15	1	4	--	--	-	-	-	-	--	-	-	56
7	-	--	1	1	12	22	8	17	2	8	--	2	-	-	-	-	--	-	-	73
8	-	1	1	4	7	4	5	6	1	3	--	1	-	-	-	-	--	-	-	32
9	-	--	--	1	1	3	6	3	2	--	--	1	-	-	-	1	--	-	-	18
10	-	--	--	---	3	1	---	2	--	1	1	--	-	-	-	-	--	-	-	8
11	-	2	--	1	---	---	---	---	1	--	--	--	-	-	-	-	--	-	-	4
12	-	--	--	---	---	---	1	---	--	--	--	--	-	-	-	-	--	-	-	1
13	-	--	--	---	---	---	---	---	--	--	--	--	-	1	-	-	--	-	-	1
16	-	--	--	---	---	---	---	1	--	--	--	--	-	-	-	-	--	-	-	1
Total	3	12	35	116	755	636	286	370	99	83	19	24	3	6	2	1	--	1	4	2455
																			No. Rep.	251
																				2706

An analysis of Ward 2 shown in the table gives a similar relationship. The family of 2 occupies a dwelling usually having 4 rooms, although a large number occupy 2, 3, 5 and 6 room dwellings. Families containing 3 members occupy houses containing from 3 to 6 rooms, the 5 room house being the most frequent. For the family of 4, the 5 and 6 room houses are the most prevalent types and a similar condition exists among the families of 6 persons. A family of 7 usually occupies a dwelling containing either 5, 6 or 7 rooms. It is interesting to note in this connection, that in both Wards 1 and 2 the families are not very large.

The conditions found in Ward 3 are indicated in table 22. The families of 2 usually occupy a 4 or 5 room dwelling and a fairly large number occupies dwellings containing from 3 to 6 rooms. Similar conditions prevail for the family of 3. Families of 4, 5 and 6 members usually occupy 5 room dwellings but a large number live in dwellings having 4 and 6 rooms. A family of 7 usually occupies 5 rooms. Where there are 2 in the family, the number of rooms occupied is 4; where there are 3 or more members in the family the number of rooms occupied is 5. In this ward the size of the dwelling does not increase in proportion to the size of the family.

TABLE No. 22.

SHOWING THE RELATIONSHIP OF THE NUMBER PER FAMILY AND THE NUMBER OF ROOMS OCCUPIED IN WARD 3.

No. in family	NUMBER OF ROOMS																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1	6	13	16	12	9	11	4	6	1	2	2	2	-	2	1	-	--	-	87
2	5	37	89	124	100	64	15	22	7	7	4	4	-	-	-	-	--	-	478
3	5	20	77	121	151	70	29	26	6	6	4	2	2	-	1	1	--	-	521
4	2	12	42	74	143	55	22	22	9	4	2	1	-	-	-	-	--	-	388
5		12	16	36	90	40	16	17	5	3	1	--	-	-	2	-	--	-	238
6		1	11	27	37	23	10	9	3	3	--	1	2	-	2	-	--	-	129
7			7	4	14	9	3	4	1	1	--	--	-	-	-	1	--	-	44
8			3	4	3	8	2	10	2	2	--	--	-	-	-	-	--	-	34
10			2	2	3	4	1	3	4	2	--	--	-	-	-	2	--	2	25
	18																		1944
Total	18	95	263	404	550	281	102	119	38	30	13	10	4	2	6	4	--	2	1944

The conditions found in Ward 4 are reported in table 23. In this ward it was found that a family of two will usually live in 4 rooms, but at the same time, it will be observed that a large number of families of the same size live in dwellings containing 1 to 6 rooms. Where there

TABLE No. 23.

SHOWING THE RELATIONSHIP OF THE NUMBER PER FAMILY AND THE NUMBER OF ROOMS OCCUPIED IN WARD 4.

No. in family	NUMBER OF ROOMS																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15 32	16 58	20	
1	28	32	23	21	10	6	3	2	-	1	2	1	--	-	-	-	2	131
2	24	85	97	162	134	37	14	12	3	2	-	4	--	-	9	-	-	583
3	27	68	110	152	125	38	11	21	2	4	-	--	--	-	-	-	-	564
4	4	50	91	138	130	54	8	14	1	5	-	20	--	-	-	-	-	515
5	8	26	54	88	93	43	12	4	1	1	-	--	--	-	-	-	-	333
6	4	10	31	56	41	35	10	8	1	1	-	--	--	-	-	-	-	197
7	1	8	11	44	26	16	9	3	1	2	-	--	--	-	-	-	-	121
8	1	3	5	12	14	8	1	3	-	3	-	--	--	-	-	-	-	50
9	--	3	4	11	4	3	1	2	-	1	-	--	--	1	-	-	-	30
10	--	---	1	1	3	3	4	--	-	1	-	1	--	1	-	-	-	15
11	--	---	1	---	---	1	--	1	-	--	-	--	--	-	-	-	-	3
12	--	1	1	---	1	---	--	--	-	--	1	--	--	1	-	-	-	5
Total	97	286	429	685	581	244	73	70	9	21	3	26		6	9	6	2	2547

are 3 members in the family, the 4 room house is used most frequently, though there are a good many families of this size living in 3 rooms or less. The 4 or 5 room house is most generally used by the family containing 4 members, although there are many such families living in 3 rooms or less. For families of 5, 6, 7 and 8 members, the most usual number of rooms occupied is 4 or 5, though many of these families live in smaller dwellings.

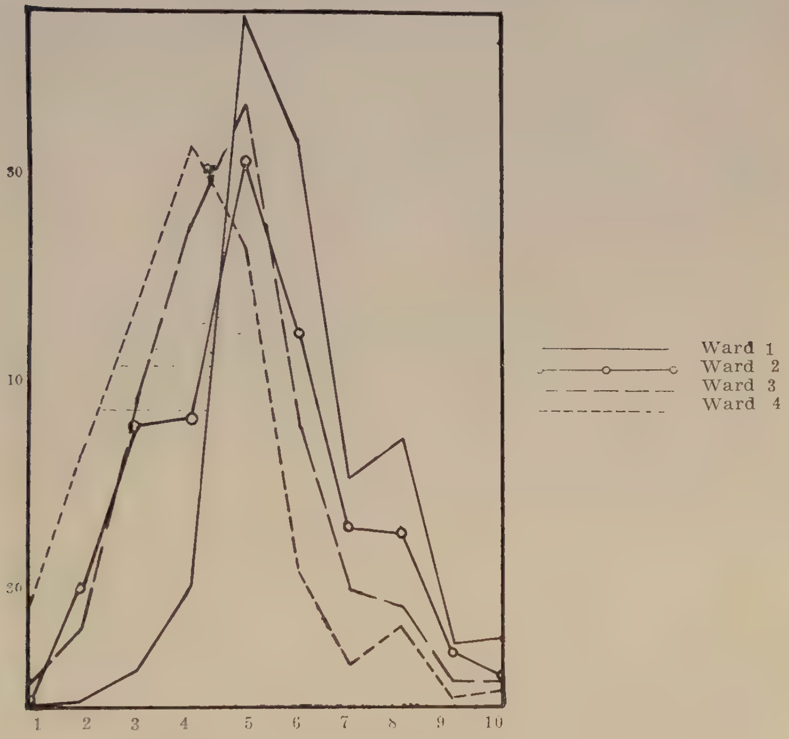
These tables show that the condition of overcrowding is far more prevalent in Ward 4 than in any other ward.. It is observed that the families in this ward are large, and live in small quarters. These facts indicate the financial condition of the residents in this ward. As was stated previously, Ward 4 is the poorest section in the city.

Besides correlating the information regarding the number of rooms in the houses and the number of people living in each house, it was possible by means of the inspection returns to tabulate the number of bed rooms found in each home. By means of this information it is possible to determine the amount of overcrowding prevalent in each ward, particularly at night.

The classification of the number of bed rooms found in each home according to wards, is shown in table 24. In Ward 1, it will be observed that very few houses have only one bed room whereas in Ward 4, there are a great many dwellings having but one bed room. Houses having two bed rooms are found very frequently in both

Chart C.

RELATIONSHIP OF NUMBER OF ROOMS OCCUPIED BY FAMILY OF THREE ACCORDING TO WARDS.



No. of rooms per dwelling.

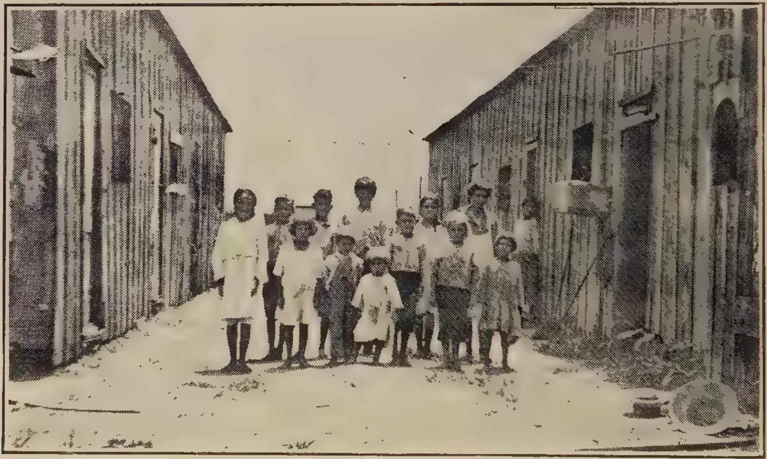
TABLE No. 24.

TABLE SHOWING THE NUMBER OF BEDROOMS IN EACH HOME—BY WARDS.

No. of Bedrooms per House	Total	Ward 1	Ward 2	Ward 3	Ward 4
1	1,792	109	431	473	779
2	3,629	1,106	740	652	1,131
3	1,858	736	449	345	328
4	977	478	235	163	101
5	266	112	72	58	24
6	81	31	22	20	8
7 and over	112	19	31	22	40
Not given	562	115	100	211	136
Total in Wards	9,277	2,706	2,080	1,944	2,537

Wards 1 and 4. It must be remembered however, that the families in Ward 4 are much larger than those in Ward 1, and that the large number of homes in Ward 4 that have two bedrooms does not mean that overcrowding is absent. Houses having 3 or more bed rooms are most numerous in Ward 1, whereas the other wards have comparatively few houses of this type.

Homes having two bedrooms are distributed very evenly throughout the whole city and in each ward. But the significance of this fact in relation to bed room overcrowding can only be ascertained by considering the size of the family in each ward at the same time. From tables 19 and 24 it may be concluded that both the one bedroom and 2 bedroom houses in Ward 4 particularly are occupied by a number of people too large for comfort and decency. It is probable however that in these overcrowded houses, other rooms in the house are utilized for sleeping purposes. In any case the situation is unsatisfactory.



A street of very poor shacks in Packingtown, where no water or toilet facilities exist, and where overcrowding is widespread.

An analysis was also made of the lighting conditions found in the homes throughout the city. As a rule the lighting was considered very good, especially in Ward 1, where the dark room is completely absent. In Ward 2 there were 162 homes having poor light and in 6 homes the lighting was considered dark, but in the vast majority of homes in this ward, the lighting was really good. When we come to Wards 3 and 4 the number of dwellings classed as having poor and dark rooms increased. This was particularly true of Ward 4.

Careful attention should be given to the matter of adequate lighting of homes and an effort should be made to prohibit the occupancy of dark room dwellings. Other indications of poor housing in Ward 4 have already been enumerated. The situation in this ward can be remedied however before the poor housing conditions have become too acute, if the situation is given immediate attention.

When the information relative to the size of the rooms in each dwelling is analyzed, a similar condition in the different wards is found. In Ward 1 almost all the dwellings have rooms, the size of which is considered satisfactory. In only a few instances is the size considered unsatisfactory . The number of dwellings having rooms of unsatisfactory size increase in the other wards of the city,

Some juvenile occupants before the entrance of a large tenement and lodging house in Packingtown, where very serious housing evils exist.

TABLE No. 25.
SHOWING THE CONDITION OF NATURAL LIGHTING IN THE HOMES, AND THE SIZE OF THE ROOMS—BY WARDS.

		LIGHTING				SIZE		
Ward	Total	Good	Poor	Dark	No rept.	Satisfactory	Unsatisfactory	No. report
1	2706	2589	25	--	92	2561	50	95
2	2080	1829	162	6	83	1766	128	186
3	1944	1622	141	19	122	1721	98	125
4	2547	2102	288	51	106	2060	238	249
Total	9277	8182	616	76	403	8108	514	655

especially in Ward 1, clearly demonstrating once more that the housing conditions in this ward are the poorest in the city. The construction of small room dwellings should be discouraged so far as it is possible to do so. It might be mentioned in this connection that it was usual to find at least one window in each room.

Water Supply

In making the housing inspection, information was obtained regarding the water facilities in each dwelling, particularly the water that is used for drinking purposes. Not only are cisterns and wells in use in addition to the public supply, but a large number of families particularly those in Ward 1, buy drinking water from the various private water companies. The following table gives the summary of the results of this census, the information being classified according to wards.

TABLE No. 26.

SHOWING THE SOURCE OF WATER USED ESSENTIALLY FOR DRINKING PURPOSES, AND THE NUMBER OF HOMES WHERE WATER IS BOUGHT—BY WARDS.

	WATER FACILITIES							BOUGHT	
Ward	Total	Cistern	Well	Public Supply	Cistern Public Supply	Well Public Supply	No Report	Yes	No
1	2706	235	280	1833	109	90	457	1413	1293
2	2080	59	682	1149	32	127	190	588	1492
3	1944	92	569	988	39	144	295	650	1294
4	2547	37	1445	825	3	149	240	267	2280
Total	9277	423	3076	4795	183	510	1182	2918	6359

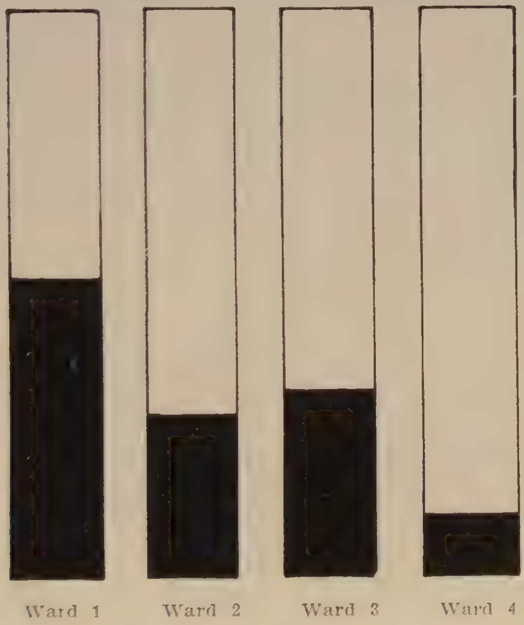
It will be observed from this table that more than half the homes in Ward 1 buy water from private companies, and that a large number of cisterns and wells are also in use. In Ward 2 there are comparatively few cisterns, but many more wells. Only about 28 percent of the families in this ward purchase water from private sources. In Ward 3 where the housing conditions are better than those in Wards considerably less than the number found in Ward 1. The number of wells is fewer than those in Ward 2 and greater than the number found in Ward 1, and about 33 percent of the families buy water. In Ward 4 the number of cisterns is very small, whereas the number of wells used is very large. In this ward the public supply is obtainable

2 and 4, the number of cisterns in use is larger than in Ward 2, though in fewer houses than in any other of the wards, and only about 10 percent of the families buy water. These facts indicate in a general way not only the housing conditions but also the financial conditions of the people in this ward. There are so many persons in Ward 4 dependent upon wells for their drinking water supply that there should be a thorough sanitary inspection and analysis of each well in order to determine the safety of the water. Much of this water is used for drinking purposes and very frequently sources of pollution exist nearby. The sources of pollution are open privies, manure piles, and exposed garbage.

CHART D.

PROPORTION OF HOMES BUYING WATER ACCORDING TO WARDS.

(Represented by Shaded Portion)



An interesting observation in this connection is that more than 2,900 families in Oklahoma City buy water from private companies for drinking purposes. The great expenditure involved and the suggestions for making the public supply safe for drinking purposes, are outlined in the chapter on water supply.

Sanitary Facilities

The following table analyzes the methods of sewage disposal available in the different wards in the city. In Ward 1, 54 privies were found, in Ward 2, there were 267 privies, in Ward 3 there were 98 privies and in Ward 4 there were 923 privies, making a total of 1,342 privies found as a result of the inspections. Since the number of houses inspected was only a fraction of the total number in the city, it is to be expected that the actual number of the privies is somewhat larger than the total given in this table.

The results obtained from this inspection are very interesting and tend to confirm the conclusions arrived at in the earlier discussion on the housing conditions. In Ward 1 where the housing conditions appeared to be the best, the least number of privies were found. In Ward 3 where the housing is second best, the number of privies was nearly twice that of Ward 1. Ward 2, with 267 privies had more privies than Wards 1 and 3 combined, while Ward 4 with the total of 923 privies had the largest number in the city. All the privies found are of the open and unprotected type and each is a potential menace to the public health.

A row of tottering shacks in Packingtown where some indescribable housing conditions prevail. Note the privy in the rear. The pump in the foreground supplies about twenty families in the neighborhood with water.

Where privies existed information was also obtained regarding the presence of a sewer on that street. It will be observed from the table that in 425 cases where a privy is known to exist, that the houses in each

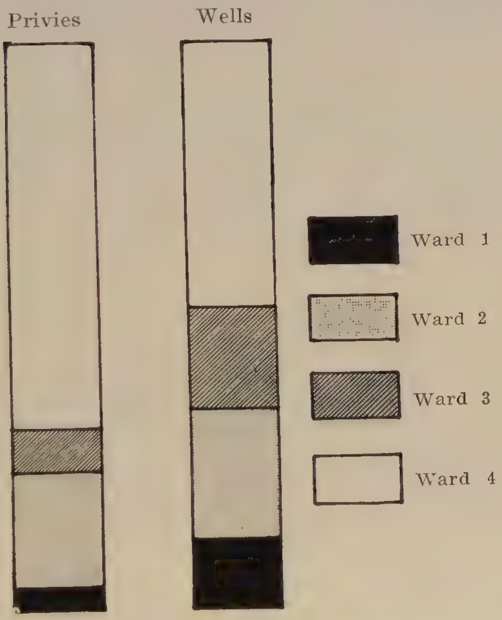
TABLE No. 27.

SHOWING THE METHOD OF SEWAGE DISPOSAL EMPLOYED—BY WARDS.

Ward	Total	Sewer	Cess-pool	Sewer on Street	No Sewer on Street	No report	No report
1	2706	2369	12	25	20	8	272
2	2080	1652	9	82	126	59	152
3	1944	1578	9	27	49	22	259
4	2547	1273	25	291	485	147	326
Total	9277	6872	55	425	680	236	1009

CHART E.

PREVALENCE OF PRIVIES AND WELLS BY WARDS.



case abutted a sewer. In such instances as these, the owner should be required to make the necessary sewer connection in order that the privy may be removed and the public health menace eliminated. In 680 cases where privies existed, there was no sewer available. In these cases an effort should be made to provide sewers in these districts as soon as possible.

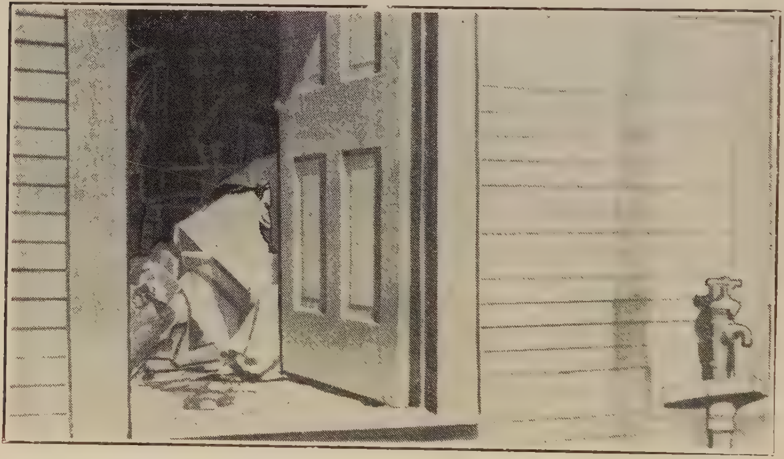
The number of cesspools in use is comparatively small, the largest number being found in Ward 4, where the sewerage is most inadequate.

The city as a whole however is well sewered, but where sewers do not exist, they should be provided at the earliest possible moment.

Methods of Garbage Disposal

Information was also obtained regarding the methods used for the disposal of garbage. The methods in use are either the collection of the garbage by the city scavenger, the feeding of the garbage to animals, the burning of the garbage, or permitting the garbage to rot on the surface of the ground. There are some houses which dispose of the garbage by arranging with private individuals to remove the waste, these individuals utilizing the garbage to feed their animals.

An analysis of the table shows that by far the largest number of homes using the city scavenger are in Ward 1, the smallest number being in Ward 4. In Ward 4 it seems to be the general practice to dispose of the garbage by feeding it to chickens, this being the case in about half of the homes in this Ward. Incineration of garbage is practiced in every ward. There were 109 cases in Ward 4 where the garbage was dumped on the surface of the ground and permitted to rot. Ward 3 had the cleanest record in this respect, and Ward 1 had



A photograph of what was the only toilet in a large tenement house off East Grand Ave. The plumbing has been disconnected and the room is now used as a store room for all kinds of rubbish. Not even privies are provided. The hydrant in front of the house is the only source of water supply for many families.

comparatively few offences of this nature. In Ward 2 this method of disposal was practiced in 55 cases. It is usual to find a serious nuisance existing where this method of disposal is employed. Not only is there a large number of flies, but there are odors given off which are particularly offensive during warm weather. It will be noted that in Ward 4 there were 442 houses which gave their garbage to private individuals for disposal. This method is practiced to the least extent in Ward 1. This condition indicates once more the financial status of the residents in the different wards, and also reflects the housing conditions which prevail in each ward.

TABLE No. 28.
TABLE SHOWING THE METHOD OF GARBAGE DISPOSAL EMPLOYED—BY WARDS.

Ward	Disposal of Garbage						Total in Ward
	City	Chicken	Burn	Yard	Other Methods	No Report	
1	1,208	614	539	11	28	306	2,706
2	825	572	431	55	70	127	1,080
3	510	639	373	---	70	352	1,944
4	241	1,113	445	109	442	197	2,547
Total	2,784	2,938	1,788	175	610	982	9,277

A few ‘‘shacks’’ on South Robinson Ave. where some unbelievable housing evils prevail. The pail in the foreground is filled with garbage and was swarming with flies. Note also the rubbish in the yard.

There is a fairly large number of colored homes in the city. Most of these are found in Ward 2. The analysis given in Table 29

TABLE No. 29.

TABLE SHOWING THE DISTRIBUTION OF HOMES ACCORDING TO THE COLOR OF THE RESIDENT—BY WARDS.

Ward	Total in Ward	Color of Resident White	Colored	No Report
1	2,706	2,478	5	223
2	2,080	1,608	305	167
3	1,944	1,604	161	179
4	2,547	2,130	159	258
Total	9,277	7,820	630	827

shows that there are very few colored homes in Ward 1, and a larger number in Wards 2 and 4. Ward 2 seems to include the largest portion of the colored population. Considering those homes where definite information was obtained concerning the color of the occupants, it was found that about 7½ percent of the homes in the city are occupied by the negroes. This would indicate that the colored population is not very large. This fact is verified by the U. S .census reports.

Summary

The city was divided into a large number of districts and precincts, and with the aid of over 400 women serving as volunteers,, 9,277 houses or 70 percent of those that existed were inspected during one week. A special form card devised particularly for this study was employed in the collection of the data. The housing conditions that prevail in the city are unusually good. Housing evils exist essentially only in certain isolated parts of the city. By far the large majority of the homes are single, detached, wooden homes, one story in height and occupied by one family. The tenement house is almost entirely absent. In the poorer sections of the city the small house predominates but in the better parts the houses are quite large and of unusually good construction and varying design. Overcrowding is usually absent, although it is found in the poorer parts of the city. Bed room overcrowding also exists in the poorer sections. It is interesting to note however that the two bedroom house is the most common home throughout the city. The natural lighting in the homes is usually good, although here again, quite a few dark and poorly lighted rooms were found in the poorer part of the city. In this section, the rooms are also frequently small. Here too, many open privies and wells abound, and many nuisances resulting from improper disposal of garbage were found. It was found that almost 32 percent of the residents buy water for drinking purposes, the largest percentage residing in the best part of the city. The colored population which is almost 10 percent of the entire population, occupies only 7.5 percent of the homes, and is segregated.

Recommendations

1. That the housing evils resulting from open privies, inadequate or polluted water supplies and improper disposal of garbage be remedied by frequent, intelligent inspections and education, and by the extension of the facilities of municipal sanitation to those sections not yet provided therewith.

2. That efforts be made by legislation, fines and education to prevent tenement houses from being built in the city, and also to overcome such evils as overcrowding, and the use of dark and small rooms.

3. That the supervision and regulation of housing facilities from the standpoint of the health, comfort and convenience of the people, shall be one of the functions of the reorganized health department.

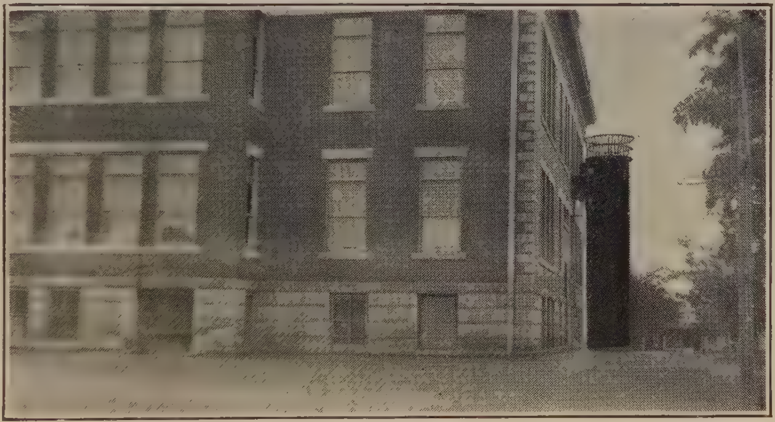
VIII.

School Sanitation

ALTHOUGH it is recognized today that the sanitation of school buildings does not play as important a part in the health of the school children as medical inspection and school nursing, nevertheless, for the general comfort and welfare of the children it is important to have the conditions in the schools as satisfactory and sanitary as possible. For this reason, the survey included a thorough study of school sanitation. It was therefore necessary to inspect every school building from the basement to the roof. The following items were given particular attention: toilet, drinking, and washing facilities; heating and ventilation; the number of seats in each room, and whether they were adjustable or not; the direction from which the natural light entered the room, and whether the lighting was good or otherwise; artificial lighting; cloak room facilities; size of room; the construction of the school; whether the building was fire-proof or not; the number of stories; number of exits; the number of stairways; and whether means for fire escape were provided.

Thirty-three schools were visited, including the High School, and many of the smaller schools. The schools are mostly built of brick, and are generally two stories high, exclusive of the basement. There are several schools that are one story in height, and are built of wood. Of the thirty-three schools, twenty-six are brick, and seven are wooden. Eight of the brick schools have annexes which are one story in height and are built of wood. Each school is satisfactorily located, is readily accessible, and is surrounded by a large open space which is generally used as a play ground. Most of the schools were found in good repair, although the annexes were generally in poorer condition than the main building. That there are annexes in connection with the brick schools, indicates that the modern school facilities available are inadequate to the demand. The school board of Oklahoma City has had a difficult problem to meet in order to keep up with the demand for school facilities which the rapidly growing city called for. In April 1918 the city passed a bond issue for $200,000.00 which is to be used for the erection of additional buildings and for the repair of those in use. The question of inadequacy of school buildings is receiving the attention of the school board and will be remedied as soon as funds are available.

The number of rooms in each school varies with the size of the school. In the High School there are seventy class rooms whereas in the grade schools the largest contains only twenty-five rooms. Most of the schools however consist of from eight to fourteen class rooms. The single story frame buildings which serve as schools in some parts of the city contain either one,two or four rooms. In one or two cases this number is somewhat increased. There are of course no stairways connected with these schools, and usually they have but one exit. For the larger schools however, the number of exits vary from two to six, including those that are reached both from the basement and from the first floor. In the larger schools there are always at least two stairways in different parts of the building. In most of the larger schools the stairways are made of stone and are perfectly free from any danger due to fire. Sixteen of the schools including the frame schools are not fire proof in construction, whereas, fourteen are fireproof. In three cases no information was obtained. In only one school where wooden stairs were used, was there no means of fire escape available. In two other schools where stone stairways were provided, but where the floors were made of wood, fire escapes were also absent. Fire escapes are also absent where the schools are constructed in a fire



The "shoot the chute" fire escape used in connection with some of the schools as a means of safe and rapid exit during emergencies. Children slide down the spiral chute into the yard.

proof way. Doubtless they are unnecessary here. There are twenty-four schools where fire escapes are not provided, and nine where such protection is afforded. This protection usually consists of spiral chutes which are made of iron and are thoroughly enclosed. In case of necessity, the children slide down the chutes to the street. In one or two cases the usual fire escapes were provided.

The size of the rooms in every case was satisfactory, the rooms being large, light and airy. Usually the light entered the rooms from the left. This was the case in twenty-four of the schools. In nine schools the light was permitted to enter either from two sides or three sides. Of these, most were the single story frame schools. Wherever possible the schools that are built in the future should permit the light to enter each room entirely from the left. This is the best arrangement, not only for the pupils, but also for the teachers. It is undesirable to have the light enter either from the right or from two sides of the room, because of the shadows produced in writing in one case, or because of the eye strain which is caused in the other case. As a rule, artificial lighting is absent in most schools. In some schools, arrangements have been made for artificial lighting but these have either not been completed or are poor. In some of the schools more recently built, artificial light was provided and this was found to be satisfactory. Although the need of artificial light in schools is not frequent, still there are times when such additional light is necessary and should be available.

Of twenty-nine schools where the question of shades was considered, it was found that in twelve cases the shutter shade was used either entirely or in part. In seventeen cases green shades were employed. Quite often these green shades were found to be in poor condition. Where poor shades exist, they should be replaced by others which are satisfactory. It would also be advisable not to use the shutter shade in the future. They are more expensive than the green shade, they collect dust quite readily and in considerable amounts, and they do not serve any better purpose than the ordinary good type of green shade.

The cloak-room facilities were found to vary in different schools. In those schools which have been built recently, the cloak rooms adjoin the class rooms and are provided with doors that are open near the floor and near the ceiling. These cloak rooms are large, light and airy and by means of the special door which is provided, are adequately ventilated. In the High School, lockers are provided. These are of the good type and also afford means for ventilation. In some schools the cloak rooms are located in the hall. These are usually not as satisfactory as the cloakrooms which are available in the newer schools. In the Franklin School the cloak rooms were all dark. In some of the frame schools, where cloakroom facilities are not provided in the hall, hooks or nails are furnished in some part of the class room, and on these the children hang their cloaks. For the great convenience of the children in these schools it would be desirable to furnish satisfactory cloakrooms.

In none of the schools that were visited were adjustable seats or desks found. The use of non-adjustable seats and desks is considered both unsatisfactory and undesirable. During school life, the body of the child is constantly growing. It is desirable therefore to seat the children in such seats as will be most comfortable, not only while at rest, but also when writing is necessary. In order to accomplish this it is necessary to adjust the seat and desk for each pupil. If this is not practiced, the body of the child may grow in an undesirable way, and even become deformed. This is so important for the welfare and comfort of the children that in the additional schools which are built, adjustable seats and desks should be provided. It would also be advisable to modify gradually the non-adjustable seats and desks in the existing schools that they too may be adjustable.

Heating and Ventilation

Of the thirty-three schools that were visited, twenty-four brick schools are heated by hot air which is driven into the room through ducts by means of a centrifugal fan. In seven of the frame schools and two brick schools the heat is furnished by the use of gas furnaces. The heating system in the brick schools is combined with a system of ventilation. The air is usually sucked in through an intake located either at the ground level or above it, and is then passed over steam coils before being sent into the rooms by means of the centrifugal fan. The air is heated so that the temperature in the rooms may be kept at 70 degrees F. When the temperature goes above this point, the amount of hot air entering the room is automatically shut down, and cold air which is unheated is allowed to mix with the warm air so as to keep the temperature at 70 degrees F. The air which enters the rooms is not humidified in any way except in the High School. Here sufficient moisture is added by permitting the heated air to pass through a spray of steam. In all the schools the air enters the rooms near the ceiling, and is removed through an opening located near the floor. No attempt is made to remove the dust from the air.

It is very likely that the method employed in furnishing air to the rooms is unsatisfactory. The air is not thoroughly distributed after entering the room, and because of that the air in all parts of the room is not constantly changed. It is true however, that the air is changed in certain sections of the room all the time. Air pockets are very likely formed in the other section. It is very doubtful at this stage in the development of the science of ventilation whether it is desirable for schools to use artificial means of ventilation. Experiments recently conducted, show that better results can be obtained by the use of the open window in combination with air deflectors, located at the windows, together with a system of steam heating, than can be obtained by the use of the heating and ventilation systems combined. Experiments have also shown that children that are housed under the open window conditions, actually suffered less from respiratory diseases and resulting absences, than did children housed in rooms where artificial ventilation was furnished. Artificial ventilation also means installation of expensive machinery and increased help in the operation of the building.

The photograph shows the type of annex which is used in connection with many schools. The annexes are frame buildings of two or four rooms, generally without water or toilet facilities in the building. Each room is heated by a separate stove.

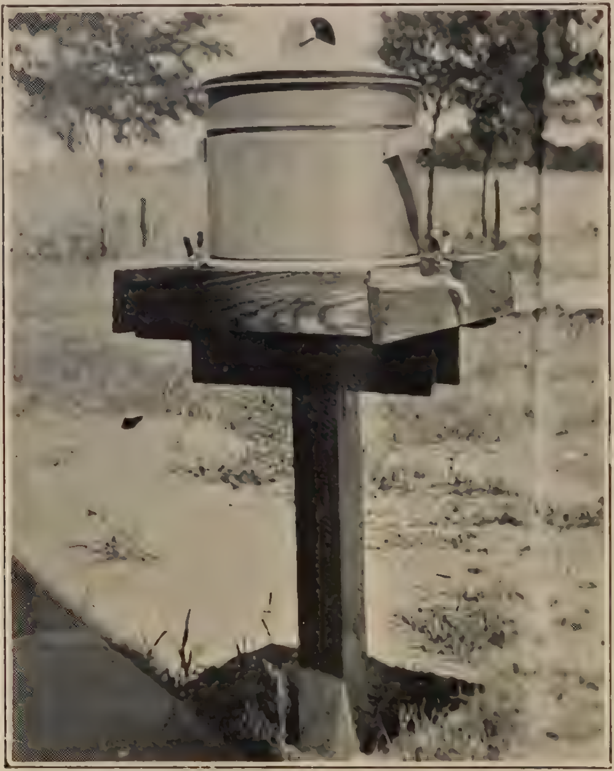
Under the artificial system of heating and ventilation it is also true that the rooms are usually overheated. Where a temperature of 70 degrees F. is desired, temperatures of 72 degrees and over, are generally obtained. Recent work has also demonstrated that 70 degrees F. and even 68 degrees F. are temperatures which are usually too high for the greatest comfort and welfare of the children. The tendency in school ventilation today, is to reduce the temperature in the class rooms so that the maximum may be at 65 degrees F. Usually the children are accustomed to temperature ranging from 60 degrees to 65 degrees F. It should not be the purpose of those in charge of heating and ventilating systems to maintain a constant temperature in the rooms. On the contrary, it is desirable, for the greater mental activity of the child and for the better reaction on the body, to have the room temperature fluctuate or vary within narrow limits. To obtain this desirable end, it should be the duty of the teacher to thoroughly air the room by opening the windows wide, at least once during the morning, and once during the afternoon. Children will feel better and work better under these conditions.

Whenever air is heated the relative humidity is lowered, providing no additional moisture is added to the air. When the air which is sent into the rooms is heated, the relative humidity becomes too low for comfort, because the air is then too dry. Such air takes up moisture from the nasal passages in passing to the lungs. The nasal passages become dry, and little cracks may be produced if the drying continues for a long time. These cracks provide portals of entry for organisms of disease. It is therefore important for heated air to be adequately humidified by the use of steam, before it is permitted to enter the rooms.

The location of the intake is another matter which should have the attention of school authorities. When the intake is located at the ground level, the air which comes in, is laden with the dust and germs which are always prevalent near the ground. Intakes should be located above the surface of the ground so as to insure a supply of air which is relatively low in dust particles and also in germ content. The intake for the High School is located at the roof. In that way, a relatively pure air is obtained. The intakes for the various grade schools are located either at the ground level or only slightly above the ground level, and hence present the objectionable conditions which have already been noted.

Drinking and Washing Facilities

One of the most serious sanitary defects in connection with the schools is the absence of adequate and safe drinking water facilities. In a few of the newer schools, bubbling fountains have been installed, but these were only used in one case. These bubblers are generally of the lip type and do not afford the protection which a properly constructed bubbling fountain should. Children will drink the water coming over the lips of the bubbler instead of "biting the bubble" thus avoiding the exchange of mouth discharges. In every school



The type of drinking can used in all the public schools. Children as a rule do not have individual drinking cups, nor are such cups provided by the school authorities. Many children drink from the faucets. Diseases like tuberculosis, diphtheria, scarlet fever, measles, mumps and whooping cough and others may be transmitted in this way. The drinking can should be abandoned, and safe and satisfactory drinking facilities substituted.

except the High School small metal tanks having one or two faucets are provided which are generally located in the yard. These tanks which are infrequently cleaned or sterilized are filled with water every day. The water usually comes from a well located on the school premises. Drinking cups are not provided. The children are supposed to have their own individual cups, but this is rather unusual. Whenever children do have individual cups, they soon become the common property of a large number of pupils and the individual drinking cup becomes the common drinking cup. This is not the only evil. Many children who do not have drinking cups at all, place the faucet between the lips and drink in that fashion. Other children who may follow immediately, and obtain the water in the same way, also obtain the germs which have been left behind. This affords a very effective means of transmitting from one child to another a disease, such as diphtheria, measles, whooping cough, mumps, scarlet fever, influenza, pneumonia, syphilis, tuberculosis,

A safe and sanitary bubbling fountain which does not permit the bubbler to become infected with the mouth washings. Only bubblers of this type should be employed.

or any other, the germs of which are given off in the mouth secretions.

In order to avoid this serious danger to the health of the children, it would be desirable to install a set of bubbling fountains operated in connection with a large tank. The water could be pumped to a tank which should be kept at a high elevation in order to furnish sufficient pressure to produce a large and satisfactory bubble. If this system is not employed, a satisfactory bubbling fountain may be set up in connecton with ordinary coolers. If the latter system is used, the water must be constantly be kept at such a height in the cooler as to provide a large bubble. However, should the public water supply become thoroughly safe for drinking purposes, the bubbling fountains could be connected with the city main directly, and drinking water obtained in this way.

A school in an outlying part of the city, showing the unprotected privies in use.

It is necessary however, to install bubblers of the safe type. Of the different types available, two may be described. One throws the water from the orifice at an angle, and permits the child to obtain water only after it has left the orifice. Any water which escapes from the mouth of the child falls perpendicularly and does not come in contact with the orifice of the bubbler. In this way the danger of leaving behind the washings of the mouth on the bubbler is obviated. Another type is one which consists of a perforated circular ring. The water issues from these various perforations and each spray is directed towards the center of the ring where the various streams of water meet and are thrown into the air as a large bubble. The child drinks from this bubble. Here too, any washings from the mouth are prevented from coming in contact with the orifices through which the water flows.

Another important matter in connection with the comfort and welfare of the children is the question of toilet facilities. In the table which has been prepared and which summarizes the conditions found in the schools, the exact number of toilet seats for both sexes is given. If these figures are considered with those given for the enrollment or even for the average daily attendance, it will be observed that the facilities provided are usually inadequate. A conservative estimate would require one toilet seat for every twenty-five boys, and one toilet seat for every twenty girls. In twenty-six of the schools the toilets were connected to the sewer. In seven cases the outside privy was employed. These privies are of the open type, not protected from flies, and in poor condition. They represent not only a serious nuisance but a possible menace to health due to the danger of the transmission of disease germs through the agency of flies. Twenty one of the toilets were found to be satisfactory from the pont of view of light and air space. The floors were usually made of cement and are readily washable. As a rule they are connected to the sewer. The seats are semi-private and are made of wood. Sufficient rolls of toilet paper are

Toilet facilities in use at one of the outlying public schools. These privies are not properly protected against flies.

provided. In ten cases the condition of the toilets was found to be poor. Of these ten, seven were the open privy type and one represented a case where the toilet facilities were outdoors. In two cases the conditions found were reported as fair.

One of the important habits to inculcate in the minds of children is the necessity for having clean hands, particularly, after visiting the toilet. To do so, however, adequate washing facilities, including running warm water and soap must be provided, and individual towels either of cloth or of paper must also be furnished. In twelve of the schools no washing facilities were provided at all. It must always be remembered however, that there are seven schools where the toilets are not connected to the sewer. These seven are included in the twelve cases where adequate washing facilities were not available. In twelve schools adequate washing facilities were provided, but soap was usually not furnished. In only one case were paper towels furnished in connection with the washing facilities. This means that the children probably do not wash their hands after visiting the toilet. The practice of washing the hands is so important from a hygienic standpoint that the absence of these proper facilities should be remedied so that this habit may be formed, and carried through life.

In twenty one schools it was possible to obtain information regarding the number of seats available, the enrollment and also the average daily attendance. It was found that there were 8,883 seats available exclusive of chairs employed for kindergarten children. The enrollment in these schools was 11,489. At the same time the average daily attendance was 7,791. It will be seen from these figures first, that there is a large number of absentees in the schools every day. In fact, the absentees average 32.2 per cent of the enrollment. Just what this condition is due to, is not definitely known. Another obvious fact, is that if all the children that are enrolled would attend school, then the seating facilities for these children would be entirely inadequate. such conditions of overcrowding favor intimate contact between children and greatly aid in the dissemination of disease. For the average daily attendance however, the number of available seats is adequate.

The accompanying table gives the results of the inspection of schools in a concise form.

Summary

Thirty-three schools were inspected from the point of view of sanitation, comfort and safety. Not all the buildings are fire proof, and in some that are not adequate means for fire escape are not provided. The natural lighting is good, although the light enters the rooms very often from more than one side and not always from the left. Facilities for artificial lighting are usually absent. The seats and desks are not adjustable. The shades are often in poor conditon, and vary in type in different schools. The cloak rooms are excellent in the newer schools, but in the older schools and in the frame annexes, they are frequently poorly ventilated and dark, or are not provided at all. The rooms are heated and ventilated by a combined system, which probably does not give satisfactory results. The air is not humidified except in the High School. A serious health menace exists in the drinking water. The toilet and washing facilities are also inadequate. It is also likely that overcrowding exists in the schools.

Recommendations

1. That adequate and proper drinking, toilet and washing facilities be provided in each school.

2. That the question of heating and ventilaton be studied along the lines advocated in the report.

3. That seats and desks be adjusted to the requirements of each child, at least twice a year.

4. That additional schools be provided to replace the old ones, and to minimize overcrowding.

5. That every school building should be made thoroughly safe against danger from fire.

IX.

School Hygiene

EVER since it has been realized that the whole child goes to school, some efforts have been made by all communities to surround the child with a pleasant and satisfactory environment. Through the far vision of such workers as Miss Lillian D. Wald of New York City, it was appreciated early, that much good could be accomplished in preserving and protecting the health of school children, if physicians and nurses entered the schools to detect physical defects and then followed up these cases until the defects had been remedied. The medical inspection of school children, supplemented by school nursing, is recognized today as one of the effective ways of curbing the ravages of disease among school children. This is accomplished by recognizing early defects and symtoms of disease, by sorting out the anemic and physically unfit from those who are in sound health and by linking up in every way the health of the child with the education necessary and desirable for its condition. In addition much good has been ascomplished through the education of the children, essentially by the school nurse, who not only teaches during her visits to the class rooms, but also when she visits the homes of the children. Much has been accomplished in this way in an effort to prevent disease and to educate the people in the proper standards of hygienic living.

The medical inspection of school children in Oklahoma City bebegan in 1912, when a physician was first employed for that purpose. He was not assisted however by a school nurse until the fall of 1917, when through an increase in the appropriation for this work, a school nurse was employed. Previous to 1917, when the Oklahoma Tuberculosis Association was reorganized on its present plan, the money that was obtained from the annual sale of Red Cross seals was used to pay for the service of a nurse who would be engaged, to some extent in the care of children. Prior to January 1919, the medical inspector of schools was employed on a half time basis. At present he is employed on a two-thirds time basis. For this he receives the salary of $1600.00 per year. The school nurse who is employed on a full time basis, receives a salary of $1,200.00 per year.

According to the table which follows, summarizing the work for the school years of 1916 to 1917, and 1917 to 1918, the medical inspec-

TABLE No. 30.

Summary of Inspection of School Buildings

NAME OF SCHOOL	Construction	Stories	Is Building Fireproof?	Fire escapes or fire chutes provided.	Number of Class Rooms	Adjustable Seats	Method of Heating	Artificial Ventilation	Drinking Facilities	Toilet Facilities		Washing Facilities Provided	Paper Towels Supplied
										Connected to Sewer	Condition		
High School	Brick	3&B	yes	no	70	no	Hot air	yes	Faucets	yes	good	yes	no
Hawthorne	Brick	2	yes	no	6	no	Hot air	yes	Tank	yes	good	yes	no
Lincoln (3 w. annexes)	Brick	2	no	yes	21	no	Hot air	no	Tank	yes	good	no	
Lowell	Brick	2&B	yes	no	10	no	Hot air	yes	Tank	yes	good	yes	no
Washington	Brick	2&B	no	yes	25	no	Steam & hot air	yes	Tank	yes	poor	no	
Lee (3 wood annexes)	Brick	2&B	yes	no	21	no	Hot air	yes	Tank	yes-no	good-poor	yes-no	no
Douglas (c) (4 annexes)	Brick	3&B	no	yes	25	no	Hot air	yes	Tank	yes	poor	no	no
High School (c)	Brick	2	no	yes	4	no	Stove	no	Tank	yes	good	yes	yes
Garfield (annex)	Brick	2&B	no	no	10	no	Hot air, stove	yes	Tank	yes	fair	no	no
Columbus	Brick	2&B	yes	no	11	no	Hot air	yes	Tank	yes	good	yes	no
Rockwood	Wood	1	no	no	2	no	Stove	no	Tank	no	poor	no	no
Walnut Grove	Wood	1	no	no	4	no	Stove	no	Tank	no	fair	no	no
Bryant	Brick	2	yes	no	12	no	Hot air	yes	Tank	yes	good	yes	no
Dunbar	4 Wood	1	no	no	8	no	Stove	no	Tank	no	poor	no	no
Junction	Wood	1	no	no	1	no	Stove	no	Tank	no	poor	no	no
Harmony	Wood	1	no	no	2	no	Stove	no	Tank	no	poor	no	no
Longfellow	Wood	1	no	no	2	no	Stove	no	Tank	no	poor	no	no
Edgemere	Brick	2&B	yes	no	10	no	Hot air	yes	Tank	yes	good	yes	no
Eugene Field	Brick	2&B	yes	no	13	no	Hot air	yes	Tank	yes	dark-good	yes	no
Linwood	Brick	2	yes	no	7	no	Stove, hot air	yes	Tank				
Whittier	Brick	2	yes	no	12	no	Hot air	yes	Tank	yes	good	yes	no
Culbertson	Brick	2&B	yes	no	15	no	Hot air	yes	Tank	yes	good	yes	no
Wheeler (1 annex)	Brick	2&B	yes	no	13	no	Hot air	yes	Tank	yes	good	yes	no
Shields Heights	Prick	2&B	yes	no	10	no	Hot air	yes	Tank	yes	good	yes	no
Willard (2 annexes)	Brick	2&B	no	yes	20	no	Stove, hot air	no	Tank	yes	good	yes	no
Sandtown	Wood	1	no	no	1	no	Stove	no	Tank	no	poor	no	no
Franklin (1 annex)	Brick	2&B	no	no	10	no	Stove, hot air	yes	Tank	yes	good	yes	no
Orchard Park (3 an'x)	Wood	1 ea	no	no	6	no	Stove	no	Tank	yes	very poor	no	no
Riverside	Brick	2&B	yes	no	11	no	Hot air	yes	Tank	yes	good	yes	no
McKinley	Brick	2&B	no	yes	12	no	Hot air	yes	Tank	yes	good	yes	no
Emerson	Brick	2&B	no	yes	23	no	Hot air	yes	Tank	yes	good	yes	no
Jefferson	Brick	2&B	no	yes	18	no	Hot air	yes	Tank	yes	good	yes	no
Putnam Heights	Brick	2&B	no	yes	13	no	Hot air	yes	Tank	yes	good	yes	yes

tor was able to examine, 10,342 children during 1916 to 1917, and 9,750 from 1917 to 1918. On the average about 10,000 children are examined per annum. The method of examination requires each child to come before the physician in the class room, who in a cursory way examines the child for conjunctivitis, for enlarged tonsils and enlarged glands, for adenoids, and for tuberculosis. At the same time the teeth of the children are examined.

TABLE No. 31.
REPORT OF MEDICAL INSPECTOR OF SCHOOL CHILDREN.

	1916-1917	1917-1918
Number of children inspected	10,342	9,750
Teeth		
Cavities Discovered	5,475	4,848
Cavities Filled	344	
Vision		
New Cases of Defective Vision	323	257
Defective Cases Remedied by Glasses	116	58
Tonsils		
Cases Showing Enlarged Tonsils	713	1,093
Parents of Such Cases Notified	63	341
Enlarged Tonsils Removed	26	120
Adenoids		
Suspected Cases of Adenoids	1,111	863
Parents of Such Cases Notified	620	14
Adenoids Removed	153	10
School Visits		
Routine	115	103
Special	91	111
Calls		
Office	88	22
Home	41	88
Communicable Diseases		
Measles	1,667	
Scarlet Fever	94	
Chicken Pox	341	
Smallpox	36	
Impetigo	42	
Mumps	83	
Vaccinated	150	1,933
Pink Eye	849	

It is impossible in this way to give the children a very thorough physical examination. The children are not weighed and measured, their lungs are not sounded, the blood pressure is not observed, and the other factors which enter into a thorough physical examination, are not followed. The thorough examination of the children is exceedingly important and should be conducted every year.

If a permanent record of the annual findings is maintained it will be possible to determine whether the child is improvng in health. Only through such careful examinations of the school children can the medical inspection be completely worth while. Children who show obvious and serious defects are required to come to the office of the medical inspector for special examination. Deformities and physical disabilities are also observed.

It will be seen from the above table that 323 new cases of defective vision were discovered in 1917, and 258 in 1918. In the former year 116 or 36 per cent of the defects were remedied by glasses. The other cases of defective vision were apparently not corrected. In 1918, 58 or 22.4 per cent of the defects were corrected. Every effort should be made to correct all the defects that are discovered. The child who suffers from defective vision cannot easily maintain a high scholastic standing.

The Sorosis Club contributes annually, a sum of money by which children having defective vision and who are unable to furnish their own glasses, may have their defects corrected without cost.

In 1917, 713 cases of enlarged tonsils were discovered, of which only 26 were removed. In 1918, 1093 cases of enlarged tonsils were discovered of which only 120 were removed. It will be observed that the percentage of cases where defects are remedied is very small. Very little good results, if the work only demonstrates the defect but does not remedy the evil.

In 1917, 1,111 cases of adenoids were discovered, of which only 153 were removed. In 1918, 863 cases of adenoids were discovered of which only 10 were removed. Here again it will be observed that the number of defects remedied is very small.

It will also be observed from the table that certain communicable diseases found in school children for 1917 are recorded. It will be seen that measles and chicken pox were epidemic during that year and that certain other diseases were unusually prevalent. It will also be seen that such diseases as diphtheria and whooping cough which are very frequent in children were not reported at all. This is but another instance of the poor reporting of communicable diseases in the city.

One of the admirable things which is done by the medical inspector, is an attempt to prevent the spread of smallpox among the school children by vaccination. In 1917, 150 children were vaccinated, and in 1918, 1933 children were vaccinated. Since there is no compulsory vaccination law in the city, such efforts on behalf of the medical inspector deserve high commendation, because they tend to eradicate a disease from which the community suffers a great deal.

Every effort is made to link up the work of the health department with the work of the medical inspector. Cases of communicable disease that are reported to the health department are also reported to the medical inspector so as to enable him to follow up such cases among school children and to prevent their spread. Children recovering from communicable diseases must obtain a certificate from the board of health before they are readmitted to the class room. The enforcement of this law however depends on the watchfulness and care of the teacher, and as a result is not always strictly enforced.

Prior to the employment of the school nurse, the home visits were made by the medical inspector. These visits were very few. At the present time the school nurse makes all the home visits. This part of school hygiene is exceedingly important and should be extended as much as possible because the child who is ill can be aided very materially, and also because the mother and other members of the family can be educated in caring for the disease and in preventing its spread.

There are no published reports of the work of the medical inspector or of the school nurse. The records are not kept in a satisfactory or scientific way. At the present time the medical inspection card which each child should have, does not follow the child from grade to grade and from school to school. This work should be reorganized completely. Each child should have a card, which should contain all the information discovered in the school regarding the health of the child. This card should follow the child throughout its school career.

Personal hygiene and sanitation are taught as part of the work of physiology by the regular teacher. At certain intervals, usually once in two years the medical inspector speaks to classes of boys on sex hygiene. These talks are probably worth while and should be continued.

At the present time no provision has been made for the employment of a dentist. Oral hygiene is so unusually important and is wrapped up so intimately with the health and welfare of the child, that this important part of school hygiene should not be neglected. At the present time the school nurse takes certain children having defective teeth, to different dentists in the city who remedy the defects without charge. The work should be placed on a more permanent basis however, and every effort should be made to have the defects remedied. Provision should be made for children who are unable to pay for the necessary treatment.

A school dental clinic in operation, showing the dentist, the school child, and the school nurse.

According to the plan for the school year 1919 to 1920, the work of the medical inspection of school children will be greatly extended. An appropration of $8,000.00 has been provided, and it is planned to employ a full time medical inspector at a salary of $3000.00 a year, and three school nurses at a salary of $1200.00 per year. The medical inspector will also have the privilege of employing a part time physician at $100.00 a month for a period of nine months. This is a step in the right direction, as will be possible to handle the whole problem much more extensively than before.

The medical inspector has devised a new report card which will follow the child throughout its school life and which will be left with the teacher of the child each semester. This card will contain a complete medical history of the child together with necessary information regarding its family. The results of more thorough examinations made by the medical inspector will also be recorded. Lastly, there will be a record of the scholastic progress of the child so as to enable the school physician to link up the health of the child with its scholastic standing. The new card seems to be an admirable advance over the previous system.

Summary

The medical inspection of school children in Oklahoma City began in 1912 when a physician was employed on a half time basis to take charge of the work. The medical inspector is now employed on a two-thirds time basis and receives $1600 annually. A school nurse was not employed until 1917, and is employed on a full time basis at $1200 per year.

The examination of the children is not complete or scientific. About 10,000 children are examined annually. Cursory examinations are made for conjunctivitis, enlarged tonsils, enlarged glands, tuberculosis, anemia, defective teeth and defective vision. Defects that are discovered are remedied in a small percent of the cases only. Vaccination is practiced as far as possible in those schools where smallpox is epidemic. The work of the medical inspector is linked up with the health department as much as possible. Children recovering from communicable diseaes are supposed to obtain a certificate of health from the health department before being readmitted to the class room. This is not always done. The records of the work are kept poorly and are not as complete as they should be. The annual reports of the work have never been published. Personal hygiene is part of the regular curriculum and is taught by the teachers. The work dealing with the school hygiene is being reorganized and it is planned to employ a full time medical inspector and three full time public health nurses. It is also planned to improve the cards on which the data are collected and to have the cards follow the child throughout its school career. No provision has been made for the employment of a dentist.

Recommendations

1. That the school hygiene work be reorganized according to the plan outlined under the reorganization of the health department.

2. That a complete, thorough, and scientific examination of each child be conducted every year, and that the data be recorded on one card which will follow the child throughout its school career.

3. That the number of home visits be increased materially among those cases that require attention.

4. That all defects which are discovered should be followed up until they are remedied, and that provision should be made for needy cases to receive the treatment necessary for curing the defect.

X.

Organization and Activities of the Health Department

OKLAHOMA City is governed by a Board of Commissioners, one of whom is designated as Commissioner of Public Safety. Under this department are merged the activities of the Health Department, Fire Department and Building Department.

The Board of Health consists of the Commissioner of Public Safety, the City Physician and the Secretary. The board exercises general supervision over the health of the city and is required to take all steps to promote the cleanliness and health of the city. Provision is also made for the care of the sick, and for emergency purposes. The Board of Health is required to submit a monthly report to the Board of Commissioners, through the Commissioner of Public Safety, showing exactly the work of the health department during the month. This report must be the result of individual reports submitted by the City Physician and the Secretary of the Board.

The City Physician is appointed by the Commissioner of Safety and is the official health officer. He is also the Superintendent of the City Hospital, and one of his duties is to visit this hospital daily. He is an attendant at the Maternity Hospital and has charge of the medical care required by the inmates of the City Jail. He is also required to examine food handlers and to issue certificates of health. The question of quarantine and release from quarantine is also under his supervision.

The Secretary of the Board of Health is appointed under civil service regulations and is the official registrar. Besides keeping a record of the proceedings of the department, he also has immediate charge of the collection of garbage, and acts as clerk for licenses and for receiving complaints pertaining to health or nuisances.

At the present time, June 1918, the personnel of the health department and the salary received by each incumbent are shown in table 32.

Of these employees the health officer and assistant City Physician serve on a part time basis. The health officer is appointed for a period of two years. No specific training or experience in public health work is required of the health officer or his corps of assistants. The health officer is a physician who has not had the necessary training in preventive medicine and public health work which is absolutely essential if one is to administer the duties of a health officer efficiently. Public health work today is a separate profession from the practice of medicine and requires men who are specially trained for that particular form of community service. A health officer who does not have this training or the point of view required for the work will not be able to carry on the work efficiently or well.

TABLE No. 32.

ORGANIZATION OF HEALTH DEPARTMENT AND SALARIES OF PERSONNEL, 1918.

Commissioner of Public Safety	$ 3,600.00
Health Officer and City Physician	1,980.00
Assistant City Physician	1,320.00
Secretary Board of Health	1,056.00
Food Inspector and Inspector of Weights and Measures	1,188.00
Quarantine Officer	1,056.00
Special Sanitary Officer	1,800.00
Two Sanitary Officers	2,112.00
City Chemist	1,500.00
Total	$15,612.00

The same may be said regarding the requirements of the assistants. Every inspector or worker required by the health department should be specially trained for the job. A milk inspector, for instance, should have training and experience in the inspection of dairies and the analysis of milk, and should be able to carry on this work efficiently. He should also be aware of the relationship between the milk supply and the public health, and appreciate the important factors that must be considered in the production of a clean and safe milk supply. This understanding can only come through proper training and experience. The same qualifications should be found in inspectors of food stores, the investigators of nuisances and in those who fumigate premises and do quarantine work. It is only through an organization composed of a trained and efficient head assisted by a properly trained corps of workers that the health of the city can be adequately protected. It is only then that the funds provided for the health protection of the people can be most wisely spent. It is the only system which should be practiced by communities that desire adequate health protection and the proper return for the money appropriated for that purpose.

The Commissioner of Public Safety has the power to make all appointments to the department of health.

In order to aid the city chemist in his work, an assistant is employed on a part time basis. He is paid at the rate of 15 cents per hour, and it is specified that he cannot be employed for more than one hundred hours during the month.

Analysis of Sanitary Code

The sanitary code of the city includes laws pertaining to the reporting, isolation and exclusion from school of school children affected with communicable diseases. It specifies that the following diseases shall be reported: cholera, smallpox, chickenpox, diphtheria, measles, scarlet fever, whooping cough, typhoid fever and tuberculosis. This list is obviously incomplete as there are other diseases that are considered communicable and are reportable in cities where better health organizations exist. In 1917 the State adopted the model law of the Census Bureau relating to the reporting of communicable diseases. Although this law has been in operation for some time, it is not practiced to a satisfactory degree. The sanitary code also specifies that children affected with communicable diseases shall be quarantined during the infectious stage of the disease. Quarantine, is not effectively practiced except in the case of smallpox. When smallpox appears in the household the patient is immediately transported to the contagious disease hospital and is treated there until the case is concluded. No other contagious disease is treated in this way.

Definite periods of quarantine for the various cases of communicable diseases are not specified in the sanitary code, nor does the code specify the conditions under which patients may be released from quarantine. For instance, in the case of diphtheria, two successive negative cultures taken from the throat within twenty-four hours are not required before the individual is released from quarantine. This practice is recognized today as essential in the control of diphtheria. The same absence of scientific method is found in connection with the other diseases.

The sanitary code provides for the thorough inspection of foods and the maintenance of proper sanitary conditions in the food stores. Raw foods must be thoroughly protected from flies and dust. Provision is also made for the inspection of these places. The sanitary code also requires that food handlers be examined by the City Physician and pronounced fit before being permitted to work; but as has already been indicated in the chapter dealing with the milk supply, the examination is entirely verbal and does not consist of the medical inspection and laboratory tests which must be made if the individual is to be pronounced fit or unfit for the handling of foods. This is undoubtedly the most important regulation in connection with the protection of foods, and if not properly carried out the protection which the community should have is not obtained.

A considerable portion of the sanitary code deals with the collection and disposal of garbage. This question has already been treated rather fully in the chapter dealing with the collection and disposal of refuse. Provision is made for the removal of manure. The law requires that manure must be removed at frequent and regular intervals. Nothing is said regarding the kind of container in which manure is to be kept, nor how often this material must be removed. The law should require that manure be stored in fly-proof receptacles, with a concrete floor and fly-proof cover. Manure should be removed at least once every seven days. Fourteen days must elapse from the time the fly eggs are laid till the adult fly can be hatched. Consequently, if manure is removed every seven days the breeding will be materially diminished.

A part of the sanitary code deals with the control of the milk supply. This part of the code is considered under the discussion of the milk supply.

It is specified in the code that births and deaths must be recorded; that antitoxin will be distributed free to the needy; that clothing, bedding and the discharges from those affected with communicable diseases must be disinfected. Provision is also made regarding the disposal of dead bodies. Those employed in connection with cemeteries are required to keep a record of the burials.

Health Department Activities

A review of the activities of the health department shows that very little is actually done to protect the health of the people. Cases of disease are inadequately reported and no attempt is apparently made to remedy the present situation. During 1917 sixteen deaths from typhoid fever were recorded and yet only thirty-six cases of typhoid were reported. It is now fairly well established that for every death from typhoid fever there are at least ten cases of the disease. This would mean that there were in all, probably at least 160 cases of typhoid in the city during 1917. In the same year 82 deaths from tuberculosis were reported while the number of cases of tuberculosis that were reported was 11. Here again the evidence points to the fact that the actual prevalence of communicable disease is not known.

During 1917, 282 cases of smallpox were reported and during the first six months of 1918, 496 cases of smallpox were reported. Compulsory vaccination is not required by the health department. It has the power to vaccinate persons whenever an emergency exists, but no real attempt is made to vaccinate children during the pre-school age, or adults during periods of epidemic. Smallpox can probably be wiped out by universal vaccination. Since the disease is so easily prevented without danger to life or health it is urged that a law be passed compelling every child to be vaccinated before entering school.

When a communicable disease comes to the attention of the health department the premises in which the case is treated are placarded. No instructions are given, however, regarding the isolation and quarantine of the patient. After the disease terminates the premises are fumigated. Fumigation is apparently only required in cases of smallpox, diphtheria, scarlet fever and measles. Formaldehyde is used in disinfecting, but apparently this work is improperly done, as the room or building is not sealed properly. The sealing of the room is usually left to the owner of the premises. During 1917, 1,229 premises were fumigated. Fumigation is necessary before quarantine is removed.

A report of the activities of the health department for 1917 shows that the City Physician made 1,881 visits to places where contagious diseases were present. There were 1,229 fumigations. About 500 certificates were issued to children stating that they were free from disease. Examinations of 156 throat cultures were made for diphtheria. No record is available regarding the number of persons vaccinated. In no case was antitoxin distributed, and no arrests were made for violation of the sanitary code.

The laboratory facilities of the health department are located in the city hall and are under the supervision of the city chemist. The city chemist is required to make all examinations of the water supply, milk supply, food products, alcoholic liquors, oil, cements, asphalt and sand. He is also required to make the bacteriological examination of water and milk submitted for analysis. Besides this he is required to make any laboratory test, such as the examination of cultures for the presence of the diphtheria bacilli or for the diagnosis of typhoid fever, malaria, tuberculosis and other communicable diseases which can be diagnosed in the laboratory. From the list of these duties it is obvious that such an individual must be particularly expert in many fields, in order to be efficient, inasmuch as the number of samples submitted for diagnosis is small. As the training of the city chemist in this line of work is limited, it is doubtful whether he can do full justice to this important phase of public health work. Not only is he required to make these analyses, but he is required to examine samples of urine sent to the laboratory, and to make examinations of stomach contents. Whenever necessary he is also supposed to make examinations for the presence of anthrax and glanders in cattle or in human beings. The laboratory is neither efficiently equipped nor adequately maintained to conduct this work on a large scale; yet the service which such a laboratory can render is one of the most important which the city health department can offer in protecting the health of the people. It is therefore urged that the diagnostic work be performed by a trained bacteriologist who will be able to conduct the tests on a large scale, and that the facilities for this work be improved and enlarged as the demands and growth of this work increase.

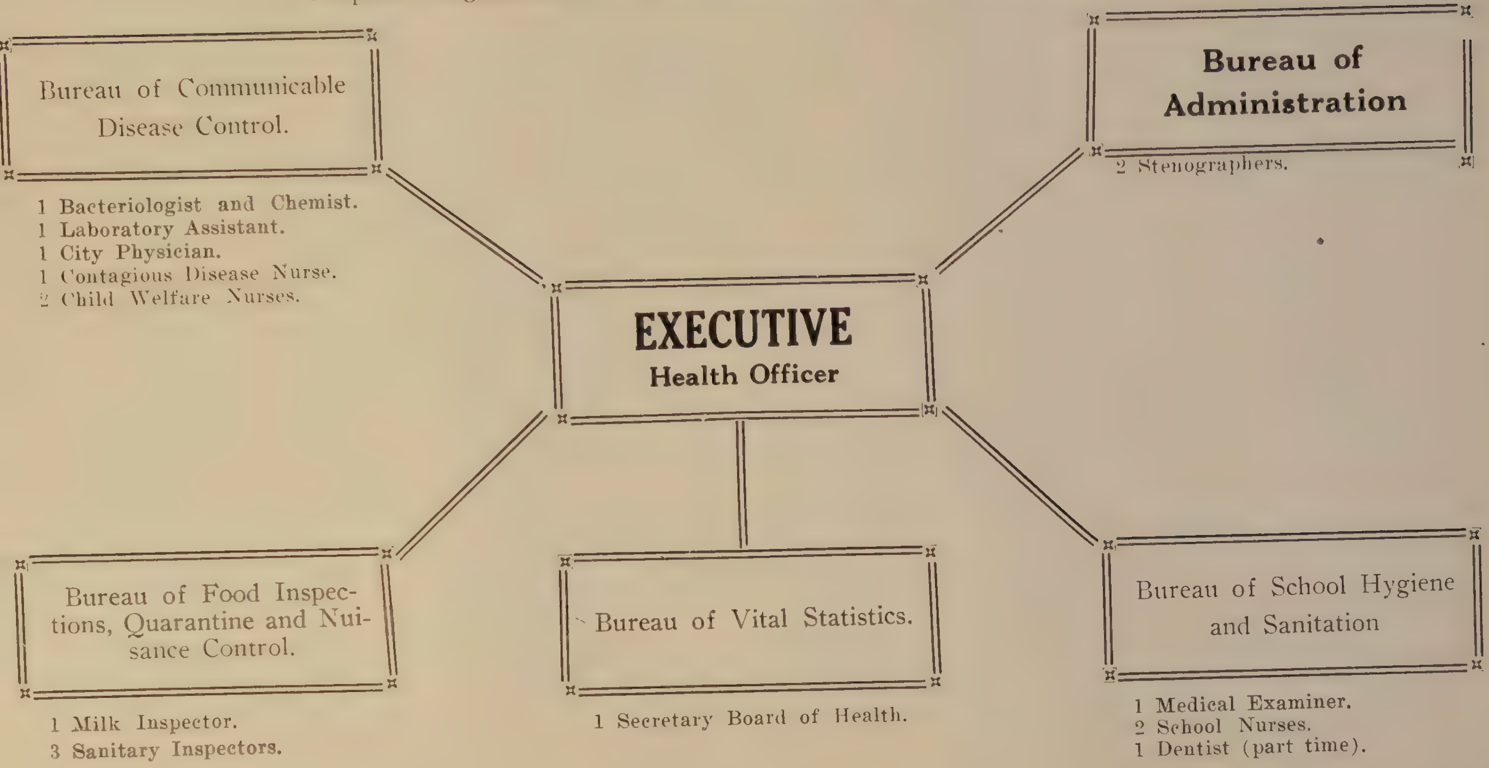
The city health department does not carry on any work in connection with child welfare, nor does it attempt to educate the people in the principles of healthy living. Public health nurses are not employed. Public health literature is not written nor distributed. Apparently, no attempt is made to educate the people in the laws of personal hygiene and community cleanliness in order that disease may be prevented. Yet it is definitely established that among the best returns from the activities of a health department are the advances made and the lives saved through the establishment of public health education, milk stations, infant welfare stations, and public health nurses.

Proposed Reorganization

After carefully examining the work of the health department it is obvious that for the adequate protection of the health of the people, it will be necessary to reorganize the department on a more modern basis , and to furnish sufficient funds for carrying on the work in a thorough and progressive way. The first step that should be taken is to employ a full time, well trained health officer. The law requires that this official shall be a physician. The main qualification should not be the medical degree but rather that the appointee shall have had special training and experience in public health work. Otherwise the benefits to be derived from such an appointment would be greatly limited. If it is possible to obtain a physician with this special training, this choice would undoubtedly be better than any other, but if such an individual cannot be obtained it would be

OKLAHOMA CITY

Proposed Organization and Personnel of the Health Department.



EXECUTIVE
Health Officer

Bureau of Administration

2 Stenographers.

Bureau of Communicable Disease Control.

1 Bacteriologist and Chemist.
1 Laboratory Assistant.
1 City Physician.
1 Contagious Disease Nurse.
2 Child Welfare Nurses.

Bureau of Food Inspections, Quarantine and Nuisance Control.

1 Milk Inspector.
3 Sanitary Inspectors.

Bureau of Vital Statistics.

1 Secretary Board of Health.

Bureau of School Hygiene and Sanitation

1 Medical Examiner.
2 School Nurses.
1 Dentist (part time).

wiser to select a non-medical man who is particularly trained and experienced in public health work.

TABLE No. 33.

PROPOSED ORGANIZATION AND PERSONNEL OF HEALTH DEPARTMENT.

City Health Officer	$ 3,500.00	
Bacteriologist and Asst. Health Officer	2,100.00	
Laboratory Assistant	1,000.00	
Milk Inspector	1,500.00	
3 Sanitary Inspectors	3,600.00	
City Physician	3,000.00	
5 Public Health Nurses	6,000.00	
2 School Nurses		
2 Child Welfare Nurses		
1 Contagious Disease Nurse		
Sec'y Board of Health—Registrar of Vitay Statistics	1,500.00	
2 Stenographers and Typists	1,800.00	
1 School Medical Examiner	3,000.00	
1 School Dentist (part time)	1,200.00	
Total Salaries		$ 28,200.00
Expenses for Laboratory Supplies—Postage, Printing, Stationery, Medicines, Hospital Supplies and Maintenance, Prophylactic Sera, Equipment, Transportation, Clinics, Welfare Stations and other expenses		$21,800.00
Total Appropriation Necessary		$50,000.00

In order to remove any handicaps under which a health officer might labor, it is desirable that he be appointed under civil service regulations, and that he be completely responsible for the appointment of his assistants. The health officer would still be responsible to the Commissioner of Public Safety, but he would feel safe in conducting his department according to his own desires. The health officer should be given a free hand in the selection of employees and in the general policy and outline of the department activities. In that way efficient action would be assured.

The accompanying chart and table give the outline for the organization of an efficient health department for a community of this size. A list of the salaries for the personnel is also included.

This does not mean, however, that the entire organization as outlined, shall be immediately introduced. It will probably be necessary for the organization to grow, although everything should be done to facilitate this growth as rapidly as possible. The crux of the whole situation lies in the employment of a well trained, efficient health officer. Given such an individual the other matters necessary for an efficient health organization would be worked out in time.

The plan provides for the establishment of a diagnostic laboratory and the appointment of a bacteriologist who will not only have charge of the laboratory, but will serve as assistant health officer.

The present city chemist should be retained in the same position and should be required to conduct all the chemical analyses in connection with the laboratory work of the health department.

A properly trained milk inspector should be appointed.

Provision is also made for the appointment of three sanitary inspectors who will look after the conditions in food stores, restaurants, lodging houses, and general housing. In addition, they will look after mosquito and fly breeding places and attend to the abatement of all nuisances.

The appointment of five public health nurses is very important. Two of these will serve as school nurses, two as child welfare nurses, and one as a contagious disease nurse. This scheme is recommended as the ideal arrangement. Under existing conditions it would probably be better for the school nurses, the school medical examiner and the school dentist, to serve under the direction of the Board of Education; but under a modern health organization conducted intelligently and efficiently, it would probably be better to have these workers serve as part of the health department organization. The school nurses will work in cooperation with the medical inspector. In that way early cases of disease will be recognized, defects will be observed and remedial measures will be recommended or actually put into effect. The scheme also provides for the appointment of a full time medical inspector whose duty it will be to examine all school children regularly. It is advisable to employ a dentist on a part time basis in connection with the health protection of the child. The dentist could do a great deal in the detection of early dental defects and the education of the child in oral hygiene.

The Board of Health should employ a secretary who shall also act as registrar. He should serve under the direction of the health officer and have charge of the vital statistics.

In addition two stenographers and typists are included in the schedule.

In the entire plan only one official is to be employed on a part time basis. All the others are to give their full time and interest to the work. It is only under such a system that the best health protection can be obtained.

In connection with the activities of the health department it would be desirable to enlist the aid of the police department. Very frequently policemen are better acquainted with the actual environmental conditions on their "beats" than most other individuals, and it would be very helpful if they could be required to call the attention of householders to unsatisfactory sanitary conditions that may exist on their premises. People who are accustomed to dispose of garbage in an unsatisfactory way or who do not remove rubbish from their back yards in time or who use their premises in some other way which gives rise to a nuisance, should be required to clean up by the police officials. By means of this co-operation a great deal of good could be accomplished.

It is recognized today that the question of garbage collection and disposal is not or should not be the function of the health department. This matter is essentially an engineering problem and should therefore, come under the direction of the engineering department. It is desirable to remove this task from the health department activities so that it may concentrate its efforts in preventing disease. It is therefore urged that the question of garbage collection and disposal be transferred from the health department to the engineering department where it properly belongs. The health department could still follow up nuisances resulting from improper garbage disposal, and look after their abatement.

Summary

Very little is done to promote the public health or to prevent disease. Smallpox is very prevalent at times, yet vaccination is not made compulsory. Communicable diseases are reported very poorly or not at all. The records of the department are not kept in an orderly and scientific way. Public health education, child welfare work, public health nursing, venereal disease clinics, infant welfare clinics and other important health activities are not practiced at all. The diagnostic laboratory is managed poorly and is not operated by a trained and skilled diagnostician. Cases of communicable diseases are either not quarantined at all, or if they are, they are not released from quarantine in a scientific way. The disinfection after quarantine is conducted unsatisfactorily. The inspection of food stores and dairies is not conducted in an intelligent and scientific way.

Recommendations

1. That the Health Department be reorganized along the lines advocated in the report.

2. That the appropriation for the health department be increased to the proposed amount, in order to permit the reorganized department to carry on its activities in a thorough and modern way.

3. That the sanitary and milk codes be revised so that a model sanitary law be put into effect. This work should be undertaken by the new health officer, with the cooperation and aid of qualified citizens of the community.

XI.

Hospital Facilities

NOT only is it the function of the community to protect the health of its citizens by preventing disease, but it is also the duty of each community to provide adequate facilities for the care of those individuals who are affected by disease or who require medical attention. Most often this work is conducted by private hospitals and institutions. Frequently, however, the city maintains a hospital of its own, operated and conducted at the expense of the community, or else provides means for the care of individuals who require medical attention and who are unable to pay for his treatment. Usually every community provides hospital facilities of some kind for the care of cases of communicable disease. The so-called pest house of years gone by, or the modern contagious disease hospital, serves as an example.

Not only is it necessary to prevent disease, but it is just as important to prevent spreading the causes of disease from individuals who are already affected. It is also important to aid in curing cases of disease, not only from the humanitarian standpoint, but also because in that way the community can be protected against the spread of disease. Cases of communicable disease can best be handled and treated under adequate hospital facilities. In this way diseases can be controlled more readily, and the after effects which result from many communicable diseases can be minimized frequently by intelligent and efficient treatment such as one may expect to obtain in a modern hospital.

The investigation of the hospital facilities is therefore a subject which logically finds its place in the health survey of a community. The work was undertaken not with the idea of studying the methods employed or the efficiency of operation, but rather to ascertain what equipment was available and the nature of the personnel in each hospital. Following are some of the factors which were considered in this study; the size and natural lighting of the private rooms and the wards; the number of beds available in each ward; the nature of the ailments that are treated; the water facilities; toilet facilities; the method of heating employed; and the facilities available for disinfecting and sterilizing infected linen, instruments and containers. Information was also obtained regarding the presence or absence of laboratory facilities, and the nature of these facilities, if they were available. Attention was also directed to the conditions found in the operating rooms. Such factors as washing facilities, natural and artificial lighting, extent of available floor space, and the presence of X-ray facilities were considered. The general cleanliness of the hospital was also noted. Observations were made to learn whether the rooms were thoroughly screened and whether adequate fire protection was afforded, either by fire proof construction, or by adequate means of escape in case of fire. Information was also obtained as to whether a training school for nurses was maintained. Other factors of a varying nature were considered and will be discussed in the report.

There are six hospitals in Oklahoma City, the largest of which is the St. Anthony Hospital which provides 150 beds. The other hospitals are: the State Baptist, the Maternity, the Wesley, the University, and the Isolation. The Maternity and the Isolation hospitals are conducted and operated by the city. The University Hospital is a State Hospital maintained in connection with the medical department of the State University. The other hospitals are all private institutions.

St. Anthony Hospital

The St. Anthony Hospital, which consists of four connecting buildings, each composed of three stories and the basement, was originally built in 1899. Since then, various additions have been made, the last addition being completed in 1917. The north wing which is the latest part of the hospital erected, and which was completed in 1917 is made of stone, brick and reinforced concrete. This building is thoroughly fire proof and is separated from the old buildings by double automatic fire doors. The ground floor of the building is used for clinical and research laboratories and provides adequate space for the medical library, lecture rooms, and housing facilities for the interns. The laboratories are well equipped and are able to conduct work of all kinds on an extensive scale. The administrative office as well as the wards and private rooms are found on the first and second floors, the third floor being devoted to surgical cases. The operating rooms are completely equipped with the best and most modern appliances. On each floor there are large and well furnished sun rooms which serve as rest rooms for convalescent patients. The hospital maintains an excellent and well equipped X-ray laboratory.

The nursing staff consists of the superintendent of nurses and fifteen sisters who are registered nurses. Besides, a training school is maintained which offers a degree to those who successfully complete a three years' course. In 1917 there were 38 pupil nurses in the training school. In 1916 the hospital treated 1602 patients. In 1917 the number treated was 1904.

University Hospital

The University Hospital is a frame structure consisting of two stories and a basement. The building was leased by the State University Medical School in 1914 and is operated by the State. At the present time (1918), a new state hospital is being erected which will be modern and fully equipped. The ward patients who are treated at this hospital are subject for study by the Oklahoma University Medical School.

View of the newly constructed University Hospital, which is provided with 176 beds, excellent surgical, medical and X-ray facilities, special research laboratories and obstetrical and social service departments.

State Baptist Hospital

The State Baptist Hospital is built of reinforced concrete and is modern and fire proof throughout. The building was erected in 1916 and opened on January 1st, 1917. It is privately owned and controlled The hospital consists of two stories and a basement, the basement being used for the kitchen, dining room, heating plant, storerooms and two wards. The offices and private rooms are located on the first floor. On the second floor there are additional private rooms besides the operating and dressing rooms. Altogether there are 27 beds available in this hospital of which 20 are located in private rooms. The private rooms are all large, well lighted, airy, and well ventilated. The two wards in the basement are small and contain three or four beds. There are two windows in each of these wards. Conditions here are not so satisfactory due to the overcrowding A nurses' training school is also maintained at the hospital, the course continuing over three years. In 1917 there were nine pupil nurses. The hospital is in charge of a registered nurse.

Wesley Hospital

This hospital is also privately owned and controlled. It is a two story brick structure exclusive of the basement. The building was erected in 1910. Originally it was an apartment house, but was remodelled to serve the purpose of a hospital. A frame addition is also part of the hospital. This is connected directly to the brick building. The basement is used entirely for the kitchen, store-rooms, and heating plant. The first floor is used for the administrative offices, wards, and private rooms. On the second floor there are two operating rooms, a sterilizing room, and several private rooms. Altogether there are fifty beds available in this hospital, of which 28 are located in private rooms, six in a childrens' ward, and sixteen in two wards containing eight beds each. The rooms are all large, light, well ventilated and satisfactorily furnished. In two of the wards overcrowding was found, but the facilities available are unusually good. The operating and sterilizing rooms are well equipped. There are laboratory and X-ray rooms, both of which are also very well equipped.

The hospital maintains a training school for nurses where the regular three year course is conducted. During the past year there were 25 pupil nurses. The hospital is in charge of a registered nurse who is also superintendent of the nurses' training school. During 1917, 1250 patients were admitted to the hospital.

Maternity Hospital

This hospital is owned and maintained by the city. It is a frame structure consisting of eight rooms, four of which are used as the home of the matron in charge. The second floor is reserved for hospital purposes. Maternity cases are sent to the institution by the city physician. The hospital also has an operating room which is fairly well equipped with tables, stands, sterilizers and the necessary supplies. Two rooms are used as wards, one of which contains three beds, and the other two beds. These rooms are not very large. There is also a single room which may be used for patients. When necessary one or two patients can be accomodated in a room on the first floor. The matron who is in charge of the hospital is not a graduate nurse.

During the year ending June 30, 1917, forty patients were admitted to the hospital. The city physician visits the hospital every day and renders service when necessary. The cost of maintenance for this hospital during this period was $1,963.70, the per capita cost therefore amounting to approximately fifty dollars.

Isolation Hospital

This hospital serves the purpose of a contagious disease hospital, but unfortunately, it is located in a very inaccessible part of the city. The hospital is about five miles from the City Hall and has no direct railroad or street car connections. It can only be reached, after a fairly long, circuitous journey along a country road. A smallpox hospital is located on the bank of the old river bed, and because of its location, is subject to floods at different times of the year. Nearby a large pool of stagnant water was also found, thus affording excellent facilities for breeding mosquitos.

The main building is of frame construction with cement floors and consisting of four wards having eight to nine beds. The wards are all well ventilated, well lighted, and have an abundance of fresh air. Although the windows are screened, some of the screens were found in poor condition permitting easy means of access for mosquitos that breed nearby. The kitchen and dining room are located in the basement. In addition to the hospital proper, there are two other buildings, one of which is used as the residence for the caretaker, and the other for the isolation of scarlet fever or diphtheria cases when necessary. When the smallpox hospital becomes full, this building is used for the overflow cases. The hospital is in charge of a graduate nurse who receives a salary of one thousand dollars per year. She is furnished with an assistant who is also a graduate nurse who receives a salary of eight hundred dollars per year. In addition there are an assistant, who is not a graduate nurse, an orderly, a cook, a helper, a laundress, and a janitor. The city physician makes regular calls at the hospital every day.

During the year ending June 30, 1917, 360 patients were admitted to the hospital at a total cost of $8,393.51. This does not include the cost for the medical care given by the city physician.

The water supply for the hospital is obtained from a shallow well, the water being stored in a galvanized iron tank before it is used. The hospital is provided with a separate sewerage system which discharges into the river.

It is unfortunate that the Isolation Hospital has been erected in such an out of the way place. Contagious disease hospitals can be built within the city limits without any fear of spreading disease to the individuals in the neighborhood. Not only should cases of smallpox be treated at the contagious disease hospital, but all other communicable diseases should be isolated and treated also. This should greatly facilitate the control of communicable diseases. It would, therefore, be advisable for the city to look forward to the building of a modern contagious disease hospital located within easy reach from any part of the city, and maintained in a highly efficient way. All cases of communicable disease should be transported to this hospital, where proper isolation and treatment can be afforded.

It is estimated that there are approximately 344 available beds for hospital purposes in the city. This includes all the beds at all the hospitals. It should be stated that the hospitals care essentially for maternity cases and for cases that require surgical attention such as appendicitis or injuries of various kinds. Typhoid cases are also handled at the hospitals. Cases of pneumonia and bone tuberculosis are also treated, but the larger number of cases of communicable disease are treated either in the home or in some cases after removal to the Isolation Hospital. It has already been indicated that conditions at the Isolation Hospital are unsatisfactory for efficient treatment.

It is estimated that a city should provide four beds in a hospital for every thousand of its population. This would mean that Oklahoma City should furnish at least 400 beds. It is gratifying to know that this number is almost furnished by the existing hospital facilities, but when it is realized that numerous patients residing in other parts of the state depend upon Oklahoma City hospitals for treatment in case of necessity, it is probably true that the available hospital facilities are found to be frequently inadequate. Those facilities that do exist, particularly those that are owned and operated under private auspices, were found to be satisfactory.

Summary

There are six hospitals available in the city, which have altogether 344 beds. The largest hospital is the St. Anthony Hospital. The city maintains two hospitals, namely, the Maternity Hospital and the Isolation Hospital. Both of these particularly the latter should be operated more efficiently, and according to more modern knowledge of medicine. Most of the hospitals conduct schools for nurses. The privately owned hospitals are well equipped and efficiently operated.

Recommendations

1. That a new, modern, centrally located and scientifically operated contagious disease hospital be provided.

2. That provision be made for increasing the number of beds in the better hospitals particularly, in order to keep pace with the demands placed upon them from all parts of the state.

XII.

Anti-Tuberculosis Activities

TUBERCULOSIS is an infectious and communicable disease caused by a micro-organism known as the tubercle bacillus. This germ is found most commonly in the sputum of infected individuals. The inhalation and ingestion of this sputum act as the primary modes of transmission of tuberculosis. If it were possible to destroy the sputum of tuberculous patients before it could reach others, the control of tuberculosis would become a comparatively simple matter.

Tuberculosis is generally a slow and insidious disease. It may take months and even years for the infection to overcome the vital resistance, and cause the disease to become active. It takes a correspondingly long period for the progress of the disease to be arrested and the patient cured. Tuberculosis is ubiquitous. It is present among all classes of society though it is most frequently associated with poverty, overcrowding and unsanitary conditions. Practically every person becomes infected before the age of twenty-one, but not all develop active tuberculosis. It is generally accepted today that a large majority of infections occur in childhood.

It is important to recognize that tuberculosis is not hereditary, that it is a curable disease, and of even greater importance, that it is preventable. The careless, open case of tuberculosis represents a real menace to the community. One undiscovered open case may be far more dangerous than many known cases that have been taught how to prevent spreading the infection.

TABLE No. 34.

NUMBER OF CASES, DEATHS AND DEATH RATES FROM ALL FORMS OF TUBERCULOSIS IN OKLAHOMA CITY, 1913-1918.

Year	Population	No. Cases Reported	Number Deaths	Death rate per 100,000 Population
1913	78,960	20	55	69.8
1914	83,559	32	61	72.9
1915	88,298	39	76	96.2
1916	92,943	11	50	53.8
1917	97,588	11	82	84.0
1918	102,233	49	95	92.8
Total		162	419	---
Average		27	70	76.6

Tuberculosis in Oklahoma City

There were 419 deaths from tuberculosis in Oklahoma City during the six year period, 1913 to 1918, but only 162 new cases of the disease were reported to the city health department during the same period. The following tables give the number of cases, deaths, and death rates for Oklahoma City by years. The death rates are compared with the rates in cities of the U. S. registration area, and of Birmingham, Kansas City and St. Louis. Similar comparisons for the other communicable diseases are made in the study of the vital statistics.

For the six year period 1913-1918, there was an annual average of seventy deaths and twenty-seven reported cases of tuberculosis. The average death rate for this period was 76.6 per 100,000 population.

It will be seen that the specific death rates from tuberculosis in Oklahoma City are remarkably lower than those which exist in the U. S. registration cities. The same is true when the comparison is made with Kansas City, St. Louis and Birmingham. The rates are lower in Oklahoma City not because the disease is less prevalent but because the deaths from tuberculosis are reported either improperly or only in part.

TABLE No. 35.

MORTALITY FROM ALL FORMS OF TUBERCULOSIS, 1912-1916.
Rates per 100,000 population.

Year	**Okla. City**	U. S. Registration Cities	Birmingham	St. Louis	Kansas City
1912	----	----	208.4	158.6	169.5
1913	**69.8**	165.5	231.4	157.9	155.6
1914	**72.9**	165.1	241.9	164.2	151.8
1915	**86.2**	162.6	206.9	144.3	173.9
1916	**53.8**	157.1	202.0	144.9	159.1

Another fact which points clearly to the poor reporting of cases of tuberculosis is observed in the table. In every year during this period more deaths from tuberculosis were reported than new cases. In 1917 for example, eighty-two deaths from tuberculosis, and only eleven cases were reported. It is impossible to fight disease sucessfully without accurate information of its prevalence. At the present time the actual death rate from tuberculosis in Oklahoma City is not definitely known, though it is probably true that the rate is at least as high as in the registration cities. The physicians of the community must be made to feel their responsibility to the people and must be urged in every way to report tuberculosis and other communicable diseases promptly and fully.

The following table classifies the deaths from tuberculosis in Oklahoma City for the years 1913 to 1917 according to age, sex and color.

Chart F.

MORTALITY FROM ALL FORMS OF TUBERCULOSIS IN OKLAHOMA CITY AND OTHER CITIES, 1912-1916.

Rates per 100,000 population.

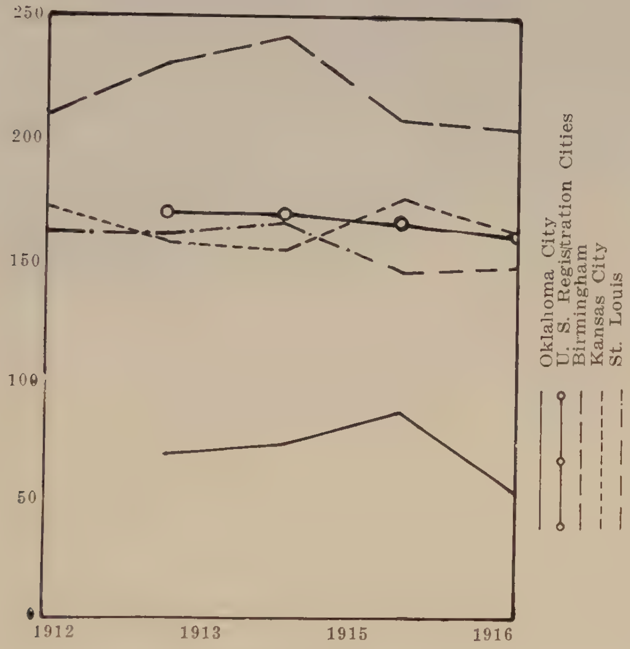


TABLE No. 36.

DEATHS FROM ALL FORMS OF TUBERCULOSIS IN OKLAHOMA CITY, 1913-1917, ACCORDING TO AGE, SEX AND COLOR.

		Sex		Age Distribution				
Year	Color	M.	F.	Under 5	5-15	15-35	35 & over	Total
1913—	W	13	15	—	—	12	16	28
	B	7	8	—	—	12	3	15
1914—	W	26	23	1	1	30	17	49
	B	10	9	1	—	15	3	19
1915—	W	31	32	2	—	31	30	63
	B	7	9	—	1	10	5	16
1916—	W	28	18	2	2	23	19	46
	B	7	7	—	1	10	3	14
1917—	W	36	25	3	—	23	35	61
	B	10	10	—	2	13	5	20
Total	W	134	113	8	3	119	117	247
	B	41	43	1	4	60	19	84

Considering the sex distribution first, it will be noted that for the five year period, 1913 to 1917, there were 134 male deaths and 113 female deaths among the white population, and 41 male deaths and 43 female deaths among the negroes. The proportion of male deaths among the whites is 54%. This is practically equivalent to the normal sex composition of the population. According to the 1910 census, the ratio of males and females in the white population was 55.8 for males and 44.2 for females.

Among the negroes the number of reported deaths was greater for the females. This is contrary to the general experience and is doubtless due to the incomplete reporting of deaths. This larger number of deaths among females is especially surprising in view of the fact that in the total negro population, the males represent 54% and the females 46%.

Of the 331 deaths from tuberculosis recorded in the table, 247 were among whites and 84 among negroes. In other words, 25% of all the deaths from this disease was among the colored population. This high mortality among the negroes is entirely out of proportion to the color distribution of the population. According to the 1910 census, the negroes made up only 10.2% of the entire population, yet they contribute 25% of all the deaths from tuberculosis.

The following table gives the death rates from tuberculosis in Oklahoma City and Birmingham according to color.

TABLE No. 37.
DEATH RATE FROM ALL FORMS OF TUBERCULOSIS 1913-1917, IN OKLAHOMA CITY AND BIRMINGHAM—ACCORDING TO COLOR.
Rate per 100,000 Population.

Year	**Oklahoma City**		Birmingham	
	W.	**B.**	W.	B.
1913	**39.6**	**186.8**	100.2	432.8
1914	**65.2**	**223.0**	107.3	448.8
1915	**79.5**	**177.6**	86.5	406.6
1916	**55.1**	**147.2**	79.0	408.4
1917	**69.5**	**200.9**		

The wide difference in the death rates from tuberculosis among whites and negroes, is true wherever there is a large negro element in the population. The unusually high death rates from this disease among the negroes is due in part to a peculiar racial susceptibility to tuberculosis, and also to the poor conditions under which they live. Poverty, overcrowding and poor personal hygiene are contributory factors.

The fact that tuberculosis is very prevalent among the colored population is of great importance to the community. The contact between the negroes and the white population is becoming increasingly intimate, so that the chances for spreading the infection among the whites are greater. Thus it is true that if the whites are to be protected against disease it is essential that the negroes be kept free from disease.

A study of the age distribution of the deaths from tuberculosis in Oklahoma City reveals the interesting fact that tuberculosis is a young man's disease. It saps the vitality of our nation by taking off its victims in the most active and productive period of life. The prevention of these early deaths or even the postponing of the age of death is of such great economic significance, that it but emphasizes the importance and value of all efforts to reduce the losses from this disease.

The occupations of persons who died from tuberculosis were obtained in 219 cases and the results are tabulated below.

TABLE No. 38.

CLASSIFICATION OF DEATHS FROM TUBERCULOSIS, 1913-1917, ACCORDING TO OCCUPATION.

Occupation	No. of Deaths	Per Cent	Occupation	No. of Deaths
Housewife	92	42%	Musician	1
Laborer	32	15%	Engraver	1
Student	14	6%	News agent	1
Farmer	6		Linotype Operator	1
Clerk	6		Horseman	1
Railroad Employee	5		Engineer	1
Merchant	5		Stenographer	1
Bookkeeper	4		Seamstress	1
Hotel work	4		Salesman	1
Grocer	4		Leather worker	1
Painter	4		Chemist	1
Teacher	3		Baker	1
Physician	3		Shoemaker	1
Tailor	3		Street work	1
Laundry	3		Dry Cleaner	1
Domestic	2		Boot Black	1
Retired	2		Carpenter	1
Boiler Maker	2		Oil Driller	1
Miner	2		Janitor	1
Plumber	1		Soldier	1
Printer	1		Brick Layer	1
			Total	219

The different age distribution of the deaths from tuberculosis among the white and the negro elements in the population is particularly noticeable. Among the whites, 119 or 48% of the total deaths occurred between the ages of 15 and 35 years; 117 or 47% of the deaths, above 35 years of age; and only 11 cases occurred under 15 years of age. Among the negroes, 60 or 71% of the total deaths occurred in the 15 to 35 year period, and only 19 or 23% of the deaths were above 35 years. Thus, not only does the negro suffer from tuberculosis more than the white, but he also dies of this disease at a much earlier age.

It will be noted that there were 92 deaths among housewives. This is equivalent to 42% of all the deaths considered. The next largest group is the laborer, of whom there were 32 deaths, or 13% of the total. Fourteen deaths or 6% occurred among students. For the 219 deaths 43 occupations were reported. If similar indoor occupations, such as student, clerk, bookkeeper and teacher, are grouped together, 27 deaths are recorded, which are equivalent to 12% of the total.

Tuberculosis in Oklahoma City does not appear to be an industrial disease from the occupations given above.

An analysis of the possible contributory factors in the prevalence of tuberculosis in Oklahoma City does not lead to any definite conclusions. The exact determination of the conditions favoring the spread of infection is the subject of a more intensive inquiry than was possible to make in the present study.

As has already been pointed out, the study of the occupations of persons dying from tuberculosis does not show that this disease is in any sense an industrial disease in Oklahoma City. The disease is known to be associated with poor living conditions and overcrowding in the home. Some of these factors were brought out in the study of the housing situation. It was found that the housing in general was very satisfactory, but that in the south part of the city and in Packingtown particularly, conditions of overcrowding, dark and poorly ventilated rooms existed. These conditions favor the spread of tuberculosis.

The transient and rooming house tuberculous constitutes a serious menace to the health of the city. Health and relief agencies are constantly beseiged by the homeless man suffering from tuberculosis. Bad as it is for these people to be without a place to rest their heads, they are handicapped further by the lack of sufficient nourishment, rest and care, which are so essential to the cure of tuberculosis. An examination of numerous case histories points to the conclusion that many consumptives migrate to Oklahoma City from the rural districts of the state in the hope of obtaining hospital care or a place to work. As a rule they are disappointed and as a result become objects of local charity. In the meanwhile they become prolific sources of tuberculous infection.

The rooming houses in the city are filled with homeless men suffering from tuberculosis, many of whom deny the nature of their ailment in order that they be permitted to occupy their room. Asthma and bronchitis are generally given as the ailment, and patients who have hemorrhages, frequently attribute them to "stomach trouble." This type of consumptive walks the streets daily as long as he can possibly do so, in an effort to find employment. Before long however, he realizes that he cannot accept steady employment because of physical weakness, shortness of breath and other symptoms. He is consequently obliged to take small jobs such as washing windows, scrubbing floors, doing porter service, for which he generally receives a meal or a few cents with which to purchase it. In the later stages of the disease we find that this man is too weak even to leave his room, so that he is dependent upon his fellow roomers to provide him with food, or in some cases to notify the proper agencies of his helplessness. A brief mention in the morning newspaper announcing the death of some unidentified person in a rooming house is the sad ending of most of these cases.

During his life this consumptive had been spreading the tubercle bacillus broadcast, infecting people everywhere. Such an individual is undoubtedly a serious menace to the community. The early diagnosis and prompt isolation of such cases in a tuberculosis hospital, would remove this danger and might give the patient a new lease of life.

During 1918 the tuberculosis society cared for thirty-nine transient and rooming house patients. Of this number, thirteen were too ill to leave their beds. The Provident Association which is frequently called upon to assist in such cases, reports that approximately 65% of its transient dependents are suffering from tuberculosis.

Lack of institutional facilities in the city and state have had a decided influence in making the control of this disease more difficult. The provision of sanatoria and tuberculosis hospitals would be a blessing not only to these poor unfortunates who cannot claim a home, but for the tuberculous residing in the city who have to remain at home uninstructed and uncared for, in a helpless condition. Since it is accepted today that tuberculous infection occurs very largely in childhood, it is exceedingly important to provide adequate hospital facilities for those patients who come in close contact with children in the home.

Measures Employed for the Control of Tuberculosis

The various measures employed at the present time in the control of tuberculosis in Oklahoma City may be classified under three general heads, Institutional, Dispensary and Nursing, and Educational.

In considering the institutional provision as a means for controlling tuberculosis, it may be said at the outset, that the State of Oklahoma does not maintain hospital or sanatorium facilities for the care of the tuberculous. Thus the tuberculosis problem in Oklahoma City is not being helped by state provision. It is also true that one of the city ordinances provides that general hospitals shall not accept cases of tuberculosis. This law has been rigidly enforced. The only public provision for the tuberculous in Oklahoma City is a special ward in the East Side Detention Hospital. This is the contagious disease hospital which is maintained by the city.

View of a children's clinic at the tuberculosis dispensary maintained by the Oklahoma City Anti-Tuberculosis Society. All children exposed to tuberculosis at home visit the dispensary at periodic intervals for weighing and examination.

Unfortunately the tuberculosis ward is open for patients only part of the time because the hospital is in great need of repairs, and patients cannot be properly cared for at all seasons of the year. Provision is made for six tuberculous cases at the maximum, but the ward is rarely filled even when the hospital is ready to accept patients. The average number of patients cared for is about three.

It is apparent from the above discussion that one of the vital parts of the program for the control of tuberculosis is almost completely lacking in Oklahoma City.

Until 1918 there was no tuberculosis dispensary in the city and the only tuberculosis nursing that was done, was conducted by the two visiting nurses of the Provident Association. These nurses were usually completly occupied in caring for the indigent sick, and could therefore give but little time to the care of the tuberculous.

The first earnest attempt to discover cases of tuberculosis and to give them satisfactory nursing and dispensary attention, began with the organization of the Oklahoma City Anti-Tuberculosis Society. Under the auspices of this Society a free tuberculosis dispensary was established in the Provident Association building. The dispensary was managed by a trained tuberculosis nurse and within a few months the work increased to such proportions that it was necessary to add another nurse to the staff.

Clinics are held at the dispensary three days of each week, including a special children's clinic every Saturday morning. The physicians attending the dispensary are men of recognized ability in the diagnosis of tuberculosis. In the children's clinic, an attempt is made to examine all children exposed to the disease at home. The work of the dispensary and the tuberculosis nurses is conducted according to the best and highest standards. After the patient's history is taken by the nurse, he is given a careful and thorough physical examination by the attending physician. Through arrangements made with the laboratory of the St. Anthony Hospital, every patient, regardless of his condition, has his sputum and urine examined. A Wasserman test and blood count are also made. In addition an X-ray picture of the chest is taken. No charge is made for these examinations except that where the patient is able, he is asked to pay $2.00 for the X-ray plate. About one patient out of four pays something for this service.

This excellent preliminary work is supplemented by well systematized follow-up work in the homes under the direction of two nurses. A very complete record system is kept of the home visits as well as the examinations in the dispensary. As a result it has been possible to tabulate some very interesting data, some of which is given in the following table:

TABLE No. 39.

RESULTS OF EXAMINATION OF 296 PATIENTS AT TUBERCULOSIS DISPENSARY DURING 1918, CLASSIFIED ACCORDING TO AGE, SEX AND STAGE OF DISEASE.

Age	Sex	T.B. of hilus.	Stage I	Stage II	Stage III	Doubtful	Non T.B.	Negative	Total
Under 5	M	3	4	0	0	11	2	0	20
	F	5	2	2	0	5	1	0	15
5 - 15	M	8	11	3	1	14	5	0	42
	F	18	18	3	0	10	9	0	58
15 - 35	M	0	10	6	7	9	0	3	35
	F	1	23	16	6	5	1	2	54
35 and over	M	0	6	15	5	6	2	2	36
	F	0	13	13	1	5	0	4	36
Total	M-F	35	87	58	20	65	20	11	296

It will be noted that 35 of the 296 patients who were examined were children under five; 100 were between the ages of five and fifteen; 89 between 15 and 35 years; and 72 above 35 years. The large number of children examined is due to the policy of the dispensary to maintain close supervision over all exposed children.

Of the 296 cases examined, 163 were females and 133 males. The larger number of females examined is due to the greater difficulty experienced in getting men to come for examination during the day. No clinics are held in the evenings. When men did appear for examination it was usually necessary for them to take a half day off from their work.

The stages of the disease given in the table are classified according to the standards prepared by the special committee of the National Tuberculosis Association. It will be noted that 35 cases were diagnosed as tuberculosis of the hilus, which is not strictly a lung infection; 87 were classified as stage one, 58 stage two, 20 stage three, 65 were classified as doubtful, 25 non-tuberculous, and 11 were considered negative. The large number of doubtful and early cases diagnosed emphasizes the value of the dispensary as an aid in the discovery and diagnosis of incipient cases of tuberculosis.

Nearly all the cases of tuberculosis of the hilus were among children under fifteen years of age. Those in the first stage were divided as follows: Six cases were under five years, 29 between the ages of five and fifteen, 33 between the ages of 15 and 35, and 19 above 35 years. The large number of cases among the early age groups, in stage one bears out the fact that tuberculosis is a young person's disease. It is probable that many of these stage one cases would have remained unrecognized had it not been for the unceasing efforts on the part of the nurses to bring these patients to the dispensary for examination, and for the careful diagnostic methods employed by the examining physicians. This stage of the disease is the most difficult to recognize, yet the disease is most curable then. An early diagnosis of the disease may mean not only a life saved, but the possibility of spreading infection is greatly minimized.

Of the stage two cases, only 8 were under fifteen years of age, 22 were between 15 and 35 years, and 28 above 35 years. Of the stage three cases only one was under fifteen, 15 were between 15 and 35 years and 6 were above 35 years. It will be noted that the more advanced stages occur almost entirely in the older age groups. This is to be expected because in the earlier age groups the disease is most often in the incipient stage. As the individual grows older, the stage of the disease progresses, especially if adequate treatment is neglected.

Of the 65 doubtful cases given in the table, 16 were under five years of age, 24 were between 5 and 15 years, 14 between 15 and 35 years, and 11 above 35 years. A large number of doubtful cases among children is due to the examination of the large number of exposed children.

Twenty cases proved to be a pulmonary infection which was not due to the tubercle bacillus. This can be determined only after the most careful analysis of the physical, laboratory and X-ray findings.

Of the 296 patients examined for tuberculosis or other pulmonary infections, only eleven were considered negative.

The nurses not only assist in the dispensary, but a considerable part of their time is spent in visiting the dispensary cases in their homes. Considerable time is also spent in visiting a large number of patients who are too ill to come to the dispensary.

The following figures taken from the nurses' annual report indicate the volume of work handled during the first year. There were 462 cases on file, including 105 out patients; 409 examinations were made in the dispensary and 1009 visits were made by patients to the dispensary. The two nurses together made 3874 home visits.

One of the most effective weapons in the war against tuberculosis is education. Education is the keynote of the modern public health movement, and has been an important factor in the improvement of the public health.

The city health department has completely neglected public health education, and thereby has overlooked one of the most important methods of aiding the people. The visiting nurses of the Provident Association carry on splendid educational work among the patients whom they visit, but unfortunately they have not been able to spread their education broadcast throughout the community.

The Oklahoma City Anti-Tuberculosis Society, has independently, and frequently with the co-operation of the State Tuberculosis Association, conducted some excellent health propaganda, which has taken a great variety of forms. The educational material which it distributes is always of the highest type and is designed especially to meet the needs of the various groups in the community. Attractive lantern slides have also been used in the moving picture theatres with excellent results.

The Society presented a set of ten panels on "The Prevention of Tuberculosis in Childhood" to twenty schools in the city, and has fostered and directed the Modern Health Crusade movement in the public schools, in which a large percentage of the school population is enrolled. The movement has been a brilliant success in educating the children in good health habits and proper living, and undoubtedly some of the good has been reflected in the living conditions at home.

With the co-operation of the State Tuberculosis Association, a large attractive exhibit of hand painted panels was shown at the State Fair, where many thousands of persons had the opportunity to examine this original display.

During the influenza epidemic of 1918, the Society not only sent its nurses to visit hundreds of patients in the homes, and mailed a letter containing helpful suggestions to every case of influenza that was reported, but it published broadcast through the use of display advertising in the newspapers, the essentials of the proper after-care of influenza in order to prevent tuberculosis.

Educational campaigns to interest the public in providing open air schools, proved very fruitful. The Society also cooperated with the city authorities during the clean-up campaign by giving the movement wide publicity and by the publishing special literature for general distribution among the people.

These various educational measures employed by the Society have had a very favorable influence on the community, and have succeeded in emphasizing in a popular way, the importance of good health.

Suggested Measures for the Further Control of Tuberculosis

The control of tuberculosis as well as other communicable diseases is a community function and should be regarded as such. Everyone in the community is affected by the presence of tuberculosis, and it should be the concern of all to see that tuberculous patients are adequately provided for. Tuberculosis is a curable and preventable disease, and it is important to realize that when the patient is given a fighting chance to recover his health, not only is he aided to cure the disease, but a great deal is done to prevent its spread.

A recent act of the State Legislature provides for the establishment by the State of two sanatoria for white persons and one for negroes. While the erection of these institutions may help relieve the local situation, it will not give Oklahoma City the tuberculosis hospital facilities which the city needs. It is therefore recommended that Oklahoma City build a separate municipal or county tuberculosis hospital with a minimum capacity of fifty beds. By enforcing the regulation of legal residence in the city, it will be possible to use this institution exclusively for the residents of the city or county. All others would be cared for in one of the state institutions. Such local facilities are vitally necessary. Without said provision, the present efforts for the control of tuberculosis will be greatly handicapped.

The value of the tuberculosis dispensary in the diagnosis and discovery of early cases of this disease has been clearly demonstrated, even in the short period of its existence. It is important that the dispensary facilities should be extended to include the negro population of the city by arranging for special negro clinics. The work among the white residents can also be extended by conducting at least one evening clinic during the week, so that those persons who work during the day, can come for examination without leaving their work and without suffering loss of wages.

Public Health Nursing

It is also exceedingly desirable to centralize and coordinate the existing public health nursing activities. At the time of this study, public health nurses were employed by the Provident Association, the Board of Education and the Tuberculosis Society. A Public Welfare Board has since been created and it is understood that this agency is also planning to employ public health nurses. Despite the greatest efforts to avoid duplication and yet to cover the whole field of public health nursing, there is no doubt that the public health nursing service in the city could be improved considerably, if all the activities were coordinated and centralized.

The ideal arrangement would be to have the health department carry on all forms of public health nursing as part of its activities, but under present conditions this plan is not possible and must be replaced by something more practical.

The following plan deserves special consideration. It provides for the centralization of all private public health work and the organization of an Oklahoma City Public Health Association. The Board of Directors of this new organization will consist of representatives of the existing health agencies in the community. The association can have different sections, such as child hygiene, tuberculosis, school nursing, and visiting nursing and each can carry on the work independently, yet as part of the whole organization. It will be possible to keep up the interest of those persons connected with the existing health organizations by appointing officers of these organizations to take charge of the work in those sections of the public health association in which they are specially interested.

By centralizing and coordinating the efforts of these various organizations interested in the public health, it will be possible to carry on a much more efficient public health campaign, including a more complete and better organized public health nursing service. The organization of such a public health association will permit the employment of a supervising nurse who will supervise and coordinate the activities of the nurses engaged in the various branches of the work. It will also prevent the duplication of activities by the different nurses who are employed at present.

Another important advantage from such an organization is that in cases of emergency, such as the recent epidemic of influenza presented, all the nurses on the staff can be used for the control and suppression of that specific disease. School nurses are employed by the Board of Education and work only nine months during the year. If these nurses were on the staff of the public health association, they would devote at least two summer months to infant welfare work at a time when the lives of so many babies are in danger.

The consolidation of all these public health activities will avoid the necessity of carrying on independent campaigns for financial support. With one organization and one treasury, the needs of the community will be carefully analyzed, the budget for the year prepared, and the necessary funds obtained in one financial drive, and expended under efficient management. Another method of financing the work if each separate organization desired to retain its independence, would be to have each contribute to the public health association an amount equal to the money expended on its present public health program. The Tuberculosis Society would contribute its share for the support of tuberculosis nurses; the Board of Education would appropriate funds for school nurses; the Health Department or Public Welfare Board would defray the cost of employing contagious disease nurses; and the Provident Association would pay for the support of the visiting nurses and so on.

Until this public health association can be perfected, it is suggested that the existing nursing agencies contribute to the support of a supervising nurse who will be in charge of all the nursing in the city, and who will report back to each of the existing organizations.

The health educational work should be continued along the present lines, and extended so as to include a comprehensive lecture system. Practical health talks should be given before groups in factories and department stores. Women's clubs, patrons' clubs, church groups, and civic organizations in the city should be kept alive to the importance of health conservation by periodic talks. Illustrated lectures should also be employed, and during special health drives, mass meetings should be arranged, and moving pictures shown.

A regular course of health instruction in the schools is very practical and of considerable value. As generally carried on at present, the study of hygiene and physiology is presented in such dull and uninteresting fashion that the children do not profit by the instruction. The subject of health can be made very attractive, and even enjoyable, if it is presented in a more personal and interesting manner. In such a case the benefits derived by the children will be far more lasting. The introduction of a health primer into the schools will also serve a very useful purpose, especially if this primer is simply worded and attractively illustrated.

The large number of children cared for at the tuberculosis dispensary indicates clearly the need of special educational facilities for the physically handicapped children. A sound body must accompany a sound mind, if the latter is to be of any value to the child.

Open Air Schools

Studies made here as well as in other cities show that a large percentage of school children are suffering from malnutrition and anemia. Such conditions are important predisposing factors in the causation of tuberculosis and should be overcome by the adoption of special measures aiding in the restoration of the child's bodily vigor.

The use of the open air school or fresh air class has helped materially in solving the problem of the physically backward child. At the present time such facilities are important adjuncts to any modern school system. The open air school is a school which is designed primarily to supply the children with the maximum amount of fresh air without exposing them to harmful drafts or severe weather. As a rule the children are furnished with special warm clothing to protect them from the severe winter weather.

An open air class in session, showing how the children are thoroughly protected against inclement weather. With adequate and wholesome food, together with rest periods, anemic children thrive better and learn more readily under these conditions.

The observance of a rest period, generally from one to two hours every afternoon, is very valuable in helping the child to regain his strength. The children lie or sleep on cots during this time. The combination of fresh air and rest has a remarkable influence on the growth and development of the child, as is shown by a rapid increase in the weight of children attending such classes.

Where the child is undernourished and much under weight, it may be advisable to furnish him with extra nourishment during the day and a warm luncheon at noon. Feeding the child is one of the expensive items connected with the maintenance of open air schools, but if food cannot be furnished, the open air class should be established regardless of this fact. Extra nourishment is undoubtedly very helpful, but by no means indispensable to the success of an open air school. If the Board of Education cannot afford to feed the children, it is likely that arrangements can be made to finance this part of the program by other agencies in the community.

The open air school is recommended for those anemic and undernourished children who need the benefits of open air. Children exposed to tuberculosis should be especially encouraged to attend these classes, but those children who have the disease should be excluded. As a matter of fact it would probably be desirable for all children to attend such fresh air classes, and the value of such a plan has been demonstrated already. Until such arrangements can be made, it is urged that such provision be made for the physically deficient children who are in immediate need of this special attention. The tuberculosis and visiting nurses, and the school medical inspector and school nurse will be in a position to select those children who seem to be particularly needful of such treatment.

The Board of Education should establish a policy of providing at least one open air class in each new building. At the present time, open air classes can be established in Oklahoma City by converting ordinary class rooms or by using the wooden annexes as open air schools.

Summary

The death rates for tuberculosis in Oklahoma City are much lower than those which exist in the United States Registration cities. The rates are lower in Oklahoma City not because the disease is less prevalent but because the deaths from tuberculosis are reported either improperly or only in part.

Twenty-five per cent of all deaths from tuberculosis occur among negroes. Yet this group makes up only 10.2% of the population. This high prevalence of tuberculosis among the negroes and the close contact of these people with the whites, make it necessary that we adopt special measures for the control of the disease among the negroes. Not only does the negro suffer from a much higher death rate from tuberculosis than the white, but he also dies of this disease at a much earlier age.

The transient and rooming house tuberculous constitute a serious health menace to the city. Because of inadequate care and poor personal hygiene these persons become a prolific source of tuberculous infection. Lack of tuberculosis hospital and sanatorium facilities makes this problem more difficult to solve.

The city health department does practically nothing in the prevention and control of tuberculosis in the city.

The work of the tuberculosis nurses and the tuberculosis dispensary of the Anti-Tuberculosis Society are of great value in discovering early cases of tuberculosis and in supervising and instructing patients in the prevention of the spread of the disease. This work is carried on according to the best and highest standards. It has also been possible to keep under close supervision a large number of children exposed to tuberculosis at home.

The educational work of the Society is also very successful.

Recommendations

1. It is recommended that Oklahoma City build and maintain a municipal or county tuberculosis hospital with a minimum capacity of fifty beds. Such an institution is necessary even though the state is beginning to make sanatorium provision.

2. The tuberculosis dispensary service should be extended to include special negro clinics. There also should be one evening clinic during the week.

3. There is an urgent need for the more perfect co-ordination of public health nursing activities. Until the health department is able to take over this work, it would be advisable to organize a public health association which would have charge of all public health nursing in the city.

4. A comprehensive lecture system should be inaugurated so as to reach every group and class in the community. Health instruction in the schools should be made a part of the curriculum and the subjects made interesting and attractive by proper presentation.

5. Open air classes should be provided in all new school buildings and the wooden annexes should be converted into open air schools. Such provision is necessary for the proper care of the physically handicapped children.

XIII.

Vital Statistics

JUST as any well organized business must keep a record of its liabilities and assets, and know exactly the status of the enterprise at any given time, so it is necessary for a community to know its liabilities and assets regarding health and disease. This necessitates having accurate and complete information regarding the population, the number of births, the number of deaths, the cause of death, the age, sex, and occupation of the individual who died, together with other factors that are usually considered under the term vital statistics. The vital statistics of a community serve as the bookkeeping of the health of the people and the growth of the city.

It has been said correctly by various health authorities, that "within certain limits a community can determine its own death rate." By this is meant, that with adequate funds, properly and wisely expended, a community can lower its death rate to within certain limits, which may be expected to exist under the most ideal conditions. But if the reporting of cases of disease, and births and deaths is inaccurate and incomplete, it will be impossible to calculate the true death rate, and it will be impossible to learn what diseases are particularly affecting the population. Without adequate knowledge of the nature and prevalence of disease in a community, it is impossible to marshal the forces of prevention intelligently and effectively in order that they may be fought and overcome. Without such information, it is also impossible to know exactly where the public funds, that have been appropriated to combat disease, should be expended. Should the money go to combat nuisances due to exposed garbage or manure, or should it go for the protection of the milk supply? Should the funds be spent in preventing infants' deaths, or typhoid fever, malaria, tuberculosis and pneumonia, or should the money be spent for housing inspection or inspection of food stores and restaurants or some other phase of public health activities. An analysis of the complete and accurate vital statistics of a community will enable us to determine not only the field which should claim the public funds, but also the amount of money which should be spent in each direction. It is obvious, that if one disease is more prevalent than another, and is causing more deaths, that disease should receive more attention and should feel the weight of the public health campaign in a greater measure.

The need for accurate and complete vital statistics is therefore very apparent. Yet in every city in Oklahoma in which a health survey was conducted, it was found that the vital statistics are exceedingly poor. Certain diseases are never reported. Others are reported only very inadequately. Births too are reported very poorly. Even deaths, are either not reported or else are reported inaccurately. Thus it is customary to find that for typhoid fever or tuberculosis or any major disease, a certain number of deaths will be reported annually; yet, at the same time, the number of cases of typhoid fever or tuberculosis reported during the same year would be abnormally low. Such conditions are not known to exist where the registration of vital statistics is satisfactory.

Again, if the vital statistics in the Oklahoma cities are compared with those of Kansas City, Mo., St. Louis, Mo., and Birmingham, Ala., cities which are typically southwestern and southern, which have the handicap of greater size and greater congestion, but which enjoy better health protection, it will be found that the rates for those cities are surprisingly higher than those for the Oklahoma cities. It is not that the Oklahoma cities enjoy immunity to disease and death which these other cities do not, but rather that these other cities report diseases and deaths more accurately and more fully. That is why these cities have been permitted to enter the registration area of the United States. The registration area is that area in which the vital statistics are considered sufficiently reliable. As yet, not a single city in Oklahoma has been permitted to join the registration area. There is not a single city in Oklahoma where the vital statistics are considered sufficiently reliable and complete.

If the vital statistics of the Oklahoma cities are compared with those for all the cities in the registration area, again, wide discrepancies will be noted between the rates. Again the difficulty lies only in the absence of reliable and adequate vital statistics of the Oklahoma cities.

It is the law in Oklahoma, that births and deaths shall be registered with the County Superintendent of Health, whereas only communicable diseases are registered with the City Superintendent of Health. This creates an undesirable situation, inasmuch as the city Superintendent of Health is ignorant of certain vital statistics which should be of great importance to him. They represent to him the extent of the prevalence of disease and death. And as he is responsible for existing health conditions, they should logically be his property. The present condition should therefore be altered. All the vital statistics of a community should be reported to the local Superintendent of Health. In this way it will be possible to avoid a division of responsibility for the keeping of records, and at the same time, enable the responsible person to know exactly the number of deaths, the causes of death and the other information that is usually available from the statistical records.

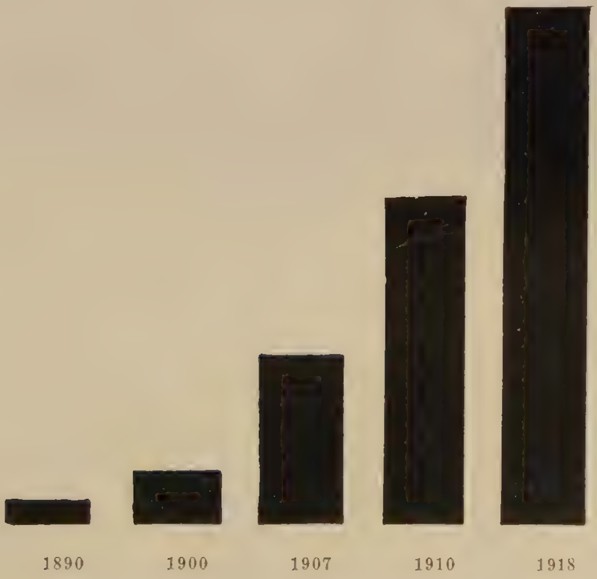
Population

The phenomenal growth of the state of Oklahoma during the past twenty years is well known throughout the country. That the main

TABLE No. 40.

Year	Population
1890	4,151
1900	10,037
1907	32,452
1910	64,205
1918	102,233

CHART F.
POPULATION 1890-1918.



centers of population also grew in an accelerated way, is therefore to be expected and will be observed from the following statistics showing the population of Oklahoma City as obtained from previous censuses, and showing also the estimated population for 1918.

One interesting thing that will be noticed is that during the three years between 1907 and 1910, the population of Oklahoma City doubled itself. The city has grown so rapidly since 1900, that the Federal Census Bureau found it necessary to take a special census in 1907. The estimated population for 1918 is based on the estimates of the Bureau of Census from 1910 to 1917. These estimates are probably very close to the actual population. As it is impossible to get a more accurate and scientific estimate of the population at this time, it will be necessary to assume that the estimated population is the true population, and base the various vital statistics rates on this population.

The composition of the population in 1910 according to color was as follows:

TABLE No. 41.

	Population	Percent
Total	64,205	100 %
White	57,493	89.6%
Negro	6,546	10.2%
Indian and other	166	0.2%

The white people are evidently most numerous in Oklahoma City. The number of Indians and others who are residents of the city is so small, as to be negligible. Even the negro population is comparatively small, since it represents only ten percent of the total population.

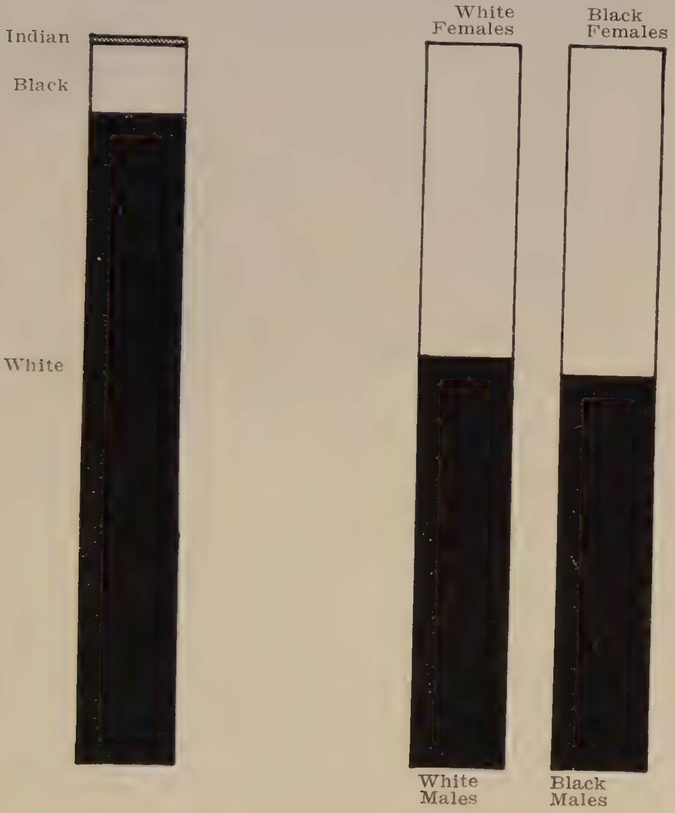
It is interesting to compare the makeup of the population by sex. It will be observed that there are more males than females. This is usually the case in communities that are comparatively new. Thus in 1910, there were practically five white males to four white females. There were more negro males than negro females too, the ratio being almost the same as among the whites. The exact distribution of the population in 1910 according to sex, follows:

TABLE No. 42.

Color	Males	Females	Percent Males	Percent Females
White	32,078	25,415	55.8	44.2
Negro	3,534	3,012	54.0	46.0

CHART H.

COMPOSITION OF POPULATION, 1910, BY RACE AND SEX.



General Death Rates

It is usually possible to tell in a general way what the health conditions in a city are, by examining the general death rate. Although such factors as climate, age distribution, race distribution, wealth, intelligence and public health protection all affect the general death rate, and make it difficult to compare the rates of one city with another, yet to a certain extent such a comparison of rates is of considerable value. The comparison is especially valuable if the rates for other cities in the same area, which are subject to the same conditions, are considered. Inasmuch as there are very few cities in the southwest which are in the registration area, this comparison could not be made. The next best thing was to compare the vital statistics of Oklahoma City with those obtained from cities in the south and

Chart I.

GENERAL DEATH RATES IN OKLAHOMA CITY AND OTHER CITIES, 1911-1918.

Rates per 100,000 population.

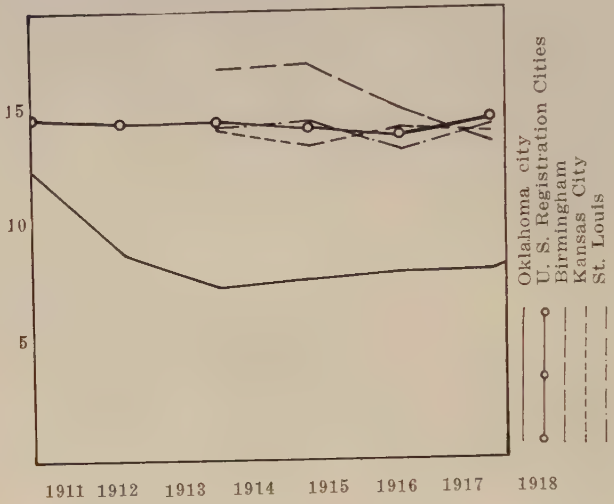


TABLE No. 43.

DEATHS FROM ALL CAUSES AND DEATH RATES IN OKLAHOMA CITY AND OTHER CITIES, 1911-1918.

Rates per 1,000 population.

		OKLAHOMA CITY					
Year	Population	Total number of deaths from all causes	Death Rate	U. S. Registration Cities	Birmingham	Kansas City	St. Louis
1911	69,454	896	12.9	15.3			
1912	74,207	692	9.3	15.0			
1913	78,960	603	7.6	15.0	17.4	14.8	14.9
1914	83,559	672	8.0	14.7	17.5	14.0	15.0
1915	88,298	734	8.3	14.4	15.6	14.7	13.8
1916	92,943	765	8.3	15.1	14.1	14.5	14.9
1917	97,588	964	9.9				
1918	102,233	1,296	12.7				

southwest which are in the registration area. To do this, it was found necessary to use the rates for Birmingham, Kansas City and St. Louis. It is true that these cities are very much larger than Oklahoma City, but it is also true that the machinery for safeguarding the public health is more active, more thoroughly organized, and more highly developed than in Oklahoma City. Therefore one would normally expect to find that the death rates in these cities would be lower than in Oklahoma City. On the other hand, it is found that the death rates are almost twice as large as those that prevail in Oklahoma City.

If the rates for Oklahoma City be compared with the rates for all the registration cities in the country, it will be found that the Oklahoma City rates are approximately one-half of the rates that are found in all the registration cities. Yet these cities which are both large and small, are very often ably protected against disease by efficient and extensive health organization.

How is it possible then, that Oklahoma City should have such an abnormally low death rate, even though it does so little to prevent disease and to protect the public health? This anomaly can be explained, not by maintaining that there is less sickness and fewer deaths, but by the fact that cases of disease and even deaths are not fully reported to the proper officials. It will be impossible to know exactly how serious the lack of adequate health protection really is, until all deaths are reported, and until these statistics are analyzed carefully and intelligently by a trained health officer. At the present time, Oklahoma City must face the fact of being unable to say accurately how many of her citizens die every year; how old they are; what the cause of death was; and other important information which every progressive city should have.

During the latter part of 1918, the country was swept by a serious epidemic of influenza-pneumonia, which resulted in the death of several hundred thousand people. That Oklahoma City was also seriously affected by the epidemic is made evident by the sharp rise in the death rate for 1918. The greater death rate is not due to more accurate reporting of deaths, but is due to the large increase in the number of deaths resulting from the epidemic.

Births and Birth Rates

In examining the birth rates for Oklahoma City, it is immediately apparent that they are unusually low. This is made obvious by comparing the birth rates with the rates that exist in cities that are in the birth registration area. The birth rate in Oklahoma City is approximately one-half of the birth rate in the cities in the birth registration area. One would conclude from these statistics that only about 50 percent of the births are reported in Oklahoma City. This is probably the true state of affairs. It was possible to carry on, in the Oklahoma City health survey, an investigation aiming to determine the extent to which the births were reported. Of 405 births which occurred in 1917, only 42 percent were found to be registered. Of 229 births which occurred in 1918, only 44 percent were found to be registered. It is obvious therefore that less than 50 percent of the births are reported in Oklahoma City. The comparison of the rates in Oklahoma City with the rates in the birth registration cities would tend to confirm this belief. The birth rates for the birth registration cities are given for two years only, as these are the only years for which the birth rates are available. The following table gives the births and calculated birth rates for Oklahoma City.

Not only was it impossible to obtain accurate information regarding the birth rate, but it was likewise impossible to learn the number of infants that die every year. Thus it has been impossible to compute the infant mortality rates for Oklahoma City. The infant mortality rate of a community is an unusually good index for determining the health conditions that prevail. It is, therefore, of great regret that these figures are not available.

TABLE No. 44.

BIRTHS AND BIRTH RATES IN OKLAHOMA CITY AND U. S. REGISTRATION CITIES.

Year	Population	Total No. of Births	Birth Rate per 1000 Population Oklahoma City	Birth Rate per 1000 Population, All Registration Cities
1911 --------------	69,454	1262	18.2	
1912 --------------	74,207	1089	14.7	
1913 --------------	78,960	1023	13.0	
1914 --------------	83,559	989	11.8	
1915 --------------	88,298	1117	12.6	25.8
1916 --------------	92,943	1377	14.8	
1917 --------------	97,588	1457	14.9	
1918 --------------	102,233	1463	14.3	

Pneumonia

The following table gives the cases, deaths and specific death rates from pneumonia of all forms for Oklahoma City, from 1913 to 1918. In the same table the rates that were found in all the registration

TABLE No. 45

DEATHS AND SPECIFIC DEATH RATES FROM PNEUMONIA IN OKLAHOMA CITY AND OTHER CITIES, 1913-1918.

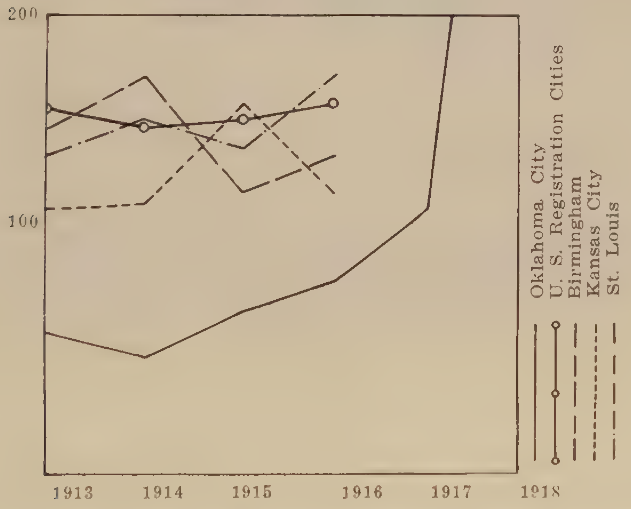
Rates per 100,000 population.

Year	Oklahoma City Number of deaths reported	Oklahoma City Specific death rate	U. S. Registration Cities	Birmingham	Kansas City	St. Louis
1913	48	60.8	158.4	149.8	115.4	138.4
1914	43	51.4	151.0	172.1	117.8	152.9
1915	63	71.4	155.6	123.5	156.3	142.1
1916	28	84.0	161.8	137.5	122.5	173.5
1917	111	113.7				
1918	494	482.0				

cities of the country are recorded. The registration city has already been defined as a city where reporting of vital statistics is considered sufficiently accurate and complete to warrant its acceptance in the registration area. The term, specific death rate means the number of deaths due to a single cause, based on 100,000 population. Included in this table are found the specific death rates for three typical cities of the south and southwest, each having more than 100,000 population. These cities are all in the registration area, and so it will be interesting to compare the rates for Oklahoma City with those that are found in these three cities, and also in all the registration cities combined.

Here again it will be observed that the pneumonia rates are lower for Oklahoma City than for the registration cities or the three cities mentioned above. Again, it is evident that the deaths from pneumonia are reported improperly and incompletely. During the epidemic of influenza which swept the United States from coast to coast, pneumonia was one of the most serious complications and caused a very large number of deaths. Pneumonia is a disease whose ravages is becoming more apparent every year, and it is absolutely necessary, if the disease is to be controlled, that it should be reported properly and fully.

CHART J.
DEATH RATE FROM PNEUMONIA IN OKLAHOMA CITY AND OTHER CITIES, 1913-1918.
Rates per 100,000 population.



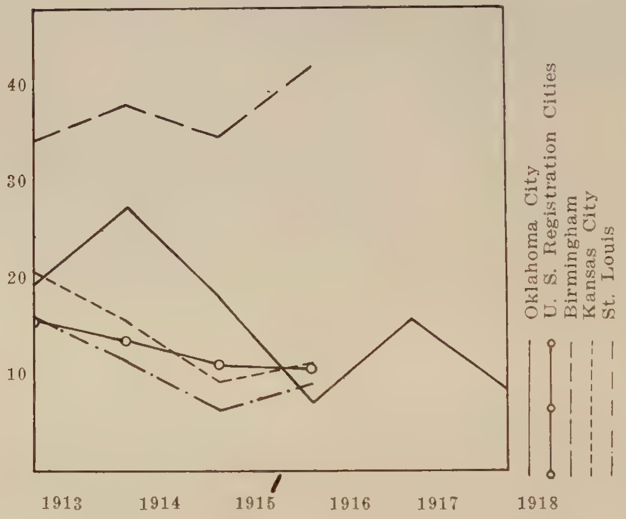
Typhoid Fever

Typhoid fever is a disease which flourishes in a community where the public drinking water supply is unsafe, where open privies abound, and where the milk supply and other food supplies are improperly protected. In the chapters dealing with the water supply, the disposal of sewage, and the milk supply, it was concluded that the public water supply was frequently unsafe, that the milk supply was not adequately safeguarded, and that in certain sections of the city, open privies abound. If the statement at the beginning of this paragraph is true, then Oklahoma City should have a fairly high typhoid fever death rate. This is actually found to be true. Whether these statistics are more accurate than the other vital statistics is not definitely known. There is no reason however to believe that they are. Yet even with inaccurate and incomplete statistics, the typhoid death rate in the city is considerably greater than it is in all the registration cities. It is greater than the the rates which prevail in St. Louis and Kansas City, but is less than the rate that is found in Birmingham. It should be remembered however, that the Birmingham rate is more accurate than that of Oklahoma City. For every death from typhoid fever there are least ten cases of the disease. Yet in Oklahoma City only about three or four cases of the

CHART K.

DEATH RATES FROM TYPHOID FEVER IN OKLAHOMA CITY AND CERTAIN CITIES, 1913-1916.

Rates per 100,000 population.



disease is reported for each death. This indicates quite clearly that the disease is reported very poorly. The disease is one which incapacitates an individual for a long time, besides creating the real danger of infecting others. It is a filth disease which can be almost entirely eradicated by proper and adequate control over the water supply, the milk supply, the disposal of excreta, the typhoid carriers, and by protective inoculation against the disease. A high typhoid fever rate in a community is recognized to-day as a blot against that community, for it is a comparatively simple matter in the light of our modern knowledge of sanitation to practically eradicate the disease.

It has also beeen shown that if typhoid fever is diminished in a community that tuberculosis and other diseases will also be diminished. It is therefore important not only to work for better registration of this disease, but to try to stamp it out.

The following table gives the statistics for typhoid fever in Oklahoma City, the registration cities, and the other three cities mentioned in the discussion.

TABLE No. 46
CASES, DEATHS AND SPECIFIC DEATH RATES FROM TYPHOID FEVER IN OKLAHOMA CITY AND OTHER CITIES, 1913-1918.
Rates per 100,000 population.

	Oklahoma City						
Year	Number of cases reported	Number of deaths reported	Specific death rate	U. S. Registration Cities	Birmingham	Kansas City	St. Louis
1913	64	16	20.3	16.4	36.0	21.9	16.9
1914	66	24	28.7	14.1	39.7	16.3	12.0
1915	43	17	19.1	11.5	36.2	9.7	6.8
1916	41	7	7.5	11.1	43.5	11.4	9.4
1917	39	16	16.4				
1918	28	9	8.8				

Malaria

Malaria is another disease that can practically be exterminated. This disease is transmitted by the female species of the anopheles mosquito. Without the mosquito, malaria cannot be propagated. The control of malaria therefore consists essentially in the control of the anopheles mosquito. This is usually accomplished by preventing the breeding of mosquitoes. Malaria is one of the most enervating diseases. Wherever it prevails, industry and enterprise doe not flourish. The disease is not usually fatal, but it is frequently widespread in the population where anopheles mosquitoes are known to exist. Therefore it is desirable to control the disease as much as possible.

From the following table it will be observed that the death rate from malaria in Oklahoma City is higher than the death rate from malaria in all the registration cities. Whether the rates are accurate and complete is not known. It is very doubtful whether scientific laboratory methods were employed in the diagnosis of the deaths that were reported. It may be that the deaths listed as malarial deaths were really due to some other cause, as other diseases are frequently confounded with malaria.

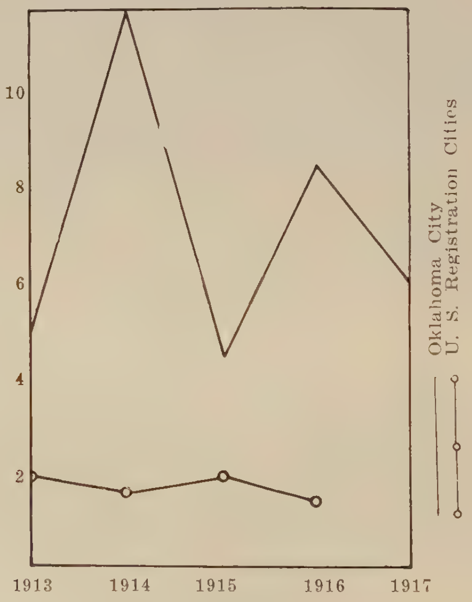
TABLE No. 47

CASES, DEATHS AND SPECIFIC DEATH RATES FROM MALARIA IN OKLAHOMA CITY AND U. S. REGISTRATION CITIES, 1913-1917.

	OKLAHOMA CITY		
Year	Number of deaths Reported	Death Rate per 100,000 population	Death rate per 100,000 population, U. S. Registration Cities
1913	4	5.1	1.9
1914	10	11.9	1.6
1915	4	4.5	1.4
1916	8	8.6	1.4
1917	6	6.1	

CHART L.

DEATH RATES FROM MALARIA IN OKLAHOMA CITY AND U. S. REGISTRATION CITIES, 1913-1917.
Rates per 100,000 population.



Diphtheria

Diphtheria, scarlet fever, measles and whooping cough are common diseases of childhood. These are diseases spread through the secretions of nose and throat. When a healthy, susceptible child comes in contact with these secretions of disease from another child or adult, the healthy child will come down with the specific disease. The prevention of infection is accomplished essentially through observing the rules of good personal hygiene. These rules are learned through the public health nurse, the medical inspector, the health officer and numerous other ways by which health information is nowadays disseminated among the people. For one of these childhood diseases, namely diphtheria, these is a specific cure. Diphtheria antitoxin if given in the very early stages of the disease is this specific. The antitoxin must be given early in the disease, however, if it is to prove effective. In order to recognize diphtheria early, it is necessary to have facilities for the laboratory diagnosis of the disease, and it is important that the diagnosis be made by a thoroughly trained and reliable

TABLE No. 48

CASES, DEATHS AND SPECIFIC DEATH RATES FROM DIPHTHERIA IN OKLAHOMA CITY AND OTHER CITIES, 1913-1918.

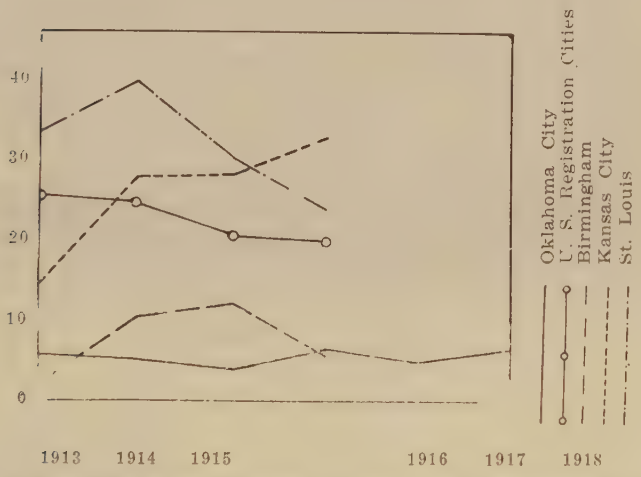
Rates per 100,000 population.

	Oklahoma City						
Year	Number of cases reported	Number of deaths reported	Specific death rate	U. S. Registration Cities	Birmingham	Kansas City	St. Louis
1913	54	4	5.1	22.3	1.9	12.8	29.2
1914	54	4	4.8	21.5	9.0	24.1	34.7
1915	150	3	3.4	18.0	10.3	24.5	26.3
1916	56	5	5.4	17.1	5.0	28.5	20.9
1917	56	4	4.1				
1918	46	6	5.8				

CHART M.

DEATH RATES FROM DIPTHERIA IN OKLAHOMA CITY AND OTHER CITIES, 1913-1918.

Rates per 100,000 population.

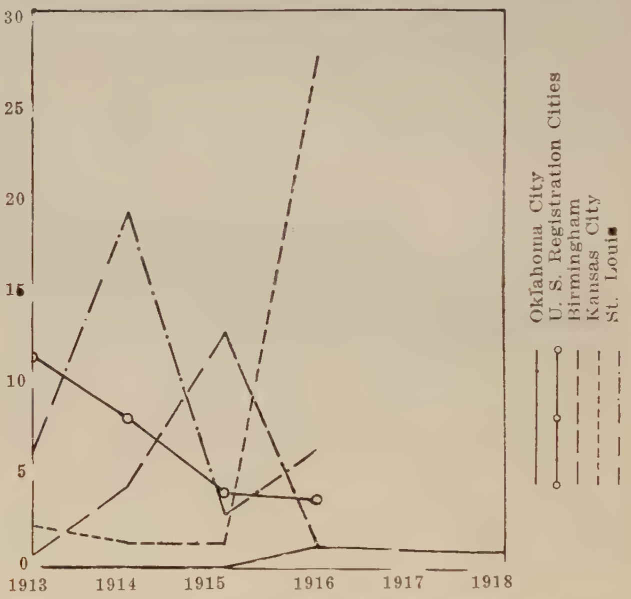


worker. The organism is frequently very difficult to recognize, and only the trained laboratory worker can be relied upon.

Since this test is not reliably performed in the laboratories of the Oklahoma City Health Department, and since diphtheria antitoxin is not extensively used, it is surprising to find that the death rate from diphtheria is lower than that found in all the registration cities. During 1917 only 156 throat cultures were examined for diphtheria in the City Health Department Laboratories and the city physician did not administer even one dose of diphtheria antitoxin.

CHART N.

DEATH RATES FROM SCARLET FEVER IN OKLAHOMA CITY AND OTHER CITIES, 1913-1918.
Rates per 100,000 population.



The rate is also lower than that which prevails in St. Louis, Kansas City and Birmingham. Here again, it is evident that diphtheria is reported inadequately and incompletely. The following tables bring out the facts clearly.

Scarlet Fever

It is hardly necessary to point out again, the discrepancy between the rates for Oklahoma City and the rates for all the registration cities and for St. Louis, Kansas City and Birmingham. The following tables give the available facts concerning scarlet fever:

TABLE No. 49

CASES, DEATHS AND SPECIFIC DEATH RATES FROM SCARLET FEVER IN OKLAHOMA CITY AND OTHER CITIES, 1913-1918.

Rates per 100,000 population.

Year	Oklahoma City Number of cases reported	Number of deaths reported	Specific death rate	U. S. Registration Cities	Birmingham	Kansas City	St. Louis
1913	10	0	0.0	11.3	0.6	2.2	6.1
1914	45	0	0.0	8.0	4.2	1.4	19.1
1915	135	0	0.0	4.0	12.6	1.4	2.9
1916	173	1	1.1	3.7	1.1	27.5	6.3
1917	86	1	1.0				
1918	38	1	1.0				

Measles.

What was said above for scarlet fever and diphtheria holds true for measles also. The poor reporting of the disease is evident.

CHART O.

DEATH RATES FROM MEASLES IN OKLAHOMA CITY AND OTHER CITIES, 1913-1918.

Rates per 100,000 population.

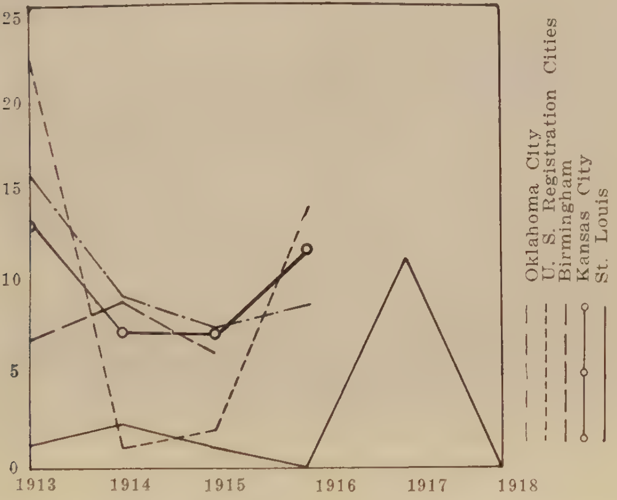


TABLE No. 50.

CASES, DEATHS AND SPECIFIC DEATH RATES FROM MEASLES IN OKLAHOMA CITY AND OTHER CITIES, 1913-1918.

Rates per 100,000 population.

Year	Oklahoma City Number of cases reported	Number of deaths reported	Specific death rate	U. S. Registration Cities	Birmingham	Kansas City	St. Louis
1913	320	1	1.3	13.2	7.0	22.3	15.8
1914	386	2	2.4	7.3	9.0	1.1	9.5
1915	48	1	1.1	7.2	6.3	2.1	7.4
1916	232	0	0.0	11.8		14.1	8.8
1917	976	10	10.2				
1918	293	0	0.0				

Whooping Cough.

The same holds true for this disease as for the other diseases which have been discussed, although the discrepancy is not nearly so marked as in the other cases. The following tables give the available data, and make the usual comparisons.

CHART P.

DEATH RATES FROM WHOOPING COUGH IN OKLAHOMA CITY AND OTHER CITIES, 1913-1918.

Rates per 100,000 population.

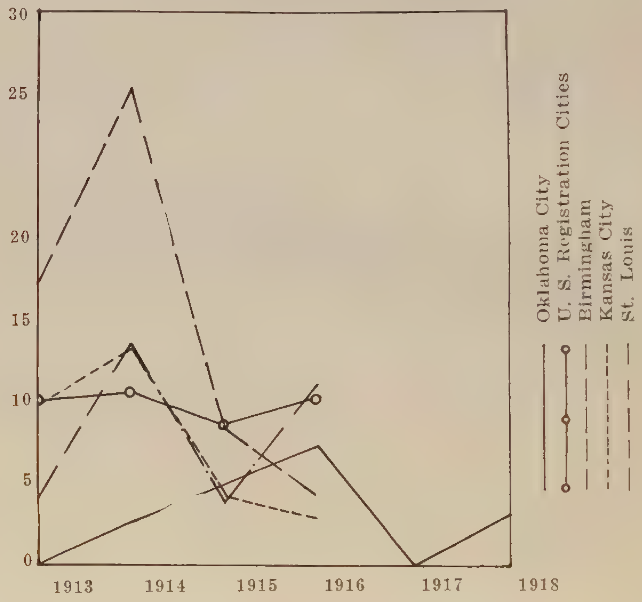


TABLE No. 51.

CASES, DEATHS AND SPECIFIC DEATH RATES FROM WHOOPING COUGH IN OKLAHOMA CITY AND OTHER CITIES, 1913-1918.

Rates per 100,000 population.

	Oklahoma City						
Year	Number of cases reported	Number of deaths reported	Specific death rate	U. S. Registration Cities	Birmingham	Kansas City	St. Louis
1913	4	0	0.0	8.9	15.2	8.8	3.7
1914	1	2	2.4	9.4	25.9	11.7	12.0
1915	0	2		7.6	7.5	3.8	3.4
1916	6	6	6.5	9.0	3.9	2.7	9.8
1917	0	0	0.0				
1918	0	3	2.9				

Smallpox

Smallpox is another disease that can be almost entirely eliminated from any community. This can be accomplished by effective vaccination of all the people. Because so many people are immune to smallpox due to previous vaccinations, the disease usually appears in the mild form today. It has therefore lost much of the terror it used to instill in a community when it made its apppearance. Nevertheless, the disease should be rooted out entirely. During the recent enlistments in the military service of the United States, every soldier and sailor was vaccinated before being inducted. This was done in order to safeguard the lives of the men and because vaccination is not dangerous to the individual.

Yet it is true that during 1917, 282 cases of smallpox were reported, and that from January 1, 1918 to June 30, 1918, 496 cases of smallpox were reported. During the entire year of 1918, 591 cases were reported. It is conceded by the health authorities that this represents only a fraction of the actual number of cases that existed. During the same year, New York City had only fourteen cases of smallpox, eleven of which contracted the disease outside of the city, two of the other three being secondary infections. New York City has a population of 5,500,000 approximately. Oklahoma City has a population of 100,000 approximately. Yet Oklahoma City had almost 600 reported cases of smallpox during 1918, and New York City had fourteen cases during 1917. New York City practices compulsory vaccination. Oklahoma City does not. The conclusion is quite obvious. If the same rate of smallpox existed in New York City as prevailed in Oklahoma City during 1918, there would have been opproximately 33,000 cases. Instead there were only fourteen. If there is any doubt that vaccination is worth while, one needs only study these figures.

Organic Heart Diseases

Although sanitation, preventive medicine and hygiene have been able to diminish the death rates from communicable diseases during the past twenty years, certain causes of death like organic heart diseases, arterio-sclerosis, cancer and other constitutional ailments have been on the increase. This is evident from the examination of the specific death rates of organic diseases of the heart, for the cities in the registration area, and also for the three cities that have been under consideration throughout this discussion.

Not only is the rate increasing in the registration cities, but the rate is an unusually high one. This cause of death is attacking men in the prime of life, when they are most active and most valuable to their families and to the communities. Therefore it is important to know the extent of these constitutional maladies among the people, and the part they play in the death rate. Yet it has not been possible to obtain such information for Oklahoma City. If organic diseases of the heart represent one of the important causes of death, that information should be known, in order that individuals may be saved through proper education in personal hygiene, through regular, thorough medical examinations, and through the living of a normal, hygienic life.

Tuberculosis

The study of the tuberculosis situation in Oklahoma City was given very careful consideration and the discussion is included under a separate chapter.

Summary

The vital statistics of Oklahoma City are unusually poor. Cases of communicable disease and even deaths are reported poorly and inadequately. One of the factors which aggravate the situation is the legal requirement in Oklahoma, that births and deaths should be reported to the County Superintendent of Health and communicable disease to the City Superintendent of Health. This division of the records makes it difficult for the City Superintendent of Health to know the extent to which people are dying and the causes of death.

Comparisons were made of the specific death rates from the most important diseases that prevail in Oklahoma City with the rates for the same diseases that prevail in St. Louis, Kansas City and Birmingham. These cities were chosen because they are in the registration area and because they are in the same part of the country. It was impossible to find cities of the same population in the registration area which were in the same section of the country and which had accurate statistics for several years back. Comparisons were also made with the rates that prevail for all the registration cities in the country. It was found that the death rate and birth rate are about one-half of the rates that prevail in the cities having more accurate statistics. The birth registration was checked up, and found to be extremely deficient. Cases of disease are very poorly reported. Typhoid fever is unusually prevalent and is probably more serious than is known at the present time. Smallpox is epidemic, but the actual number of cases is not known. The diseases of childhood such as diphtheria, scarlet fever, measles and whooping cough, are also poorly reported. The death rates from these diseases are lower than those found in other communities where the statistics are more accurate. No information could be obtained about the death rates from organic diseases of the heart and other degenerative diseases.

The population of the city has increased very rapidly and for 1918 was estimated to be 102,233. About ten percent of the population is composed of negroes and only 0.2 percent is Indians. 55 percent of the population is male and 45 percent female.

Recommendations

1. That a continued, active and vigorous campaign be instituted among the physicians for the complete and accurate reporting of cases of communicable disease and deaths. The model vital statistics law adopted by the state should be the guide in the reporting of all vital statistics.

2. That all vital statistics should be reported to the City Superintendent of Health.

XIV.

Analysis of City Budget

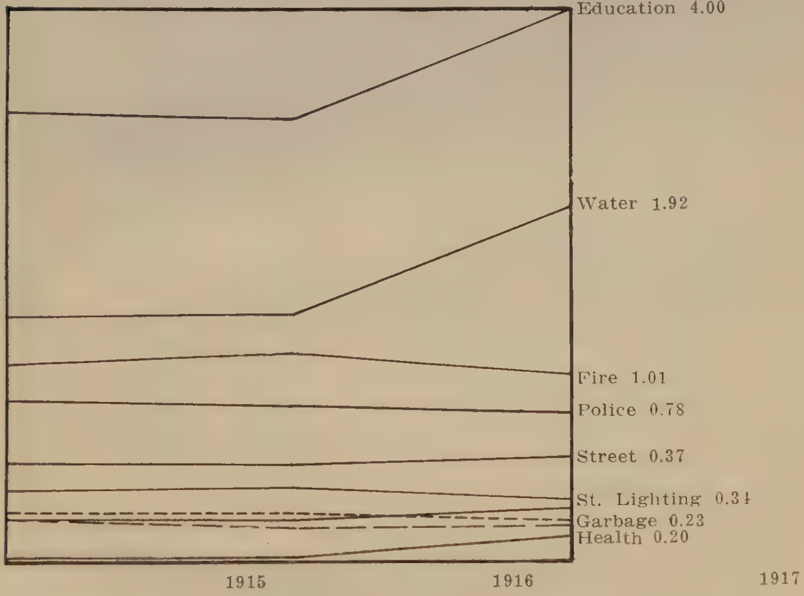
ONE of the surest guides in determining whether a community is adequately protecting the public health is to ascertain how much money is being spent for health protection, and for what health activities that money is spent. Not only is it possible to obtain information on this point, but by studying the relative appropriations for various municipal activities, one is able to determine the relative value which the people place on the different functions of the municipal government. If one should inquire of any public spirited citizen in a community, whether he thought it was important to protect the public health, he would unquestionably reply in the affirmative. Health, which is one of the prime essentials to human happiness is something which is usually taken for granted. Yet the procedure to be followed, in order to obtain the desired condition is apparently only known to a few communities in the country. These are usually the progressive, enterprising, throbbing centers of life. They have learned by experience, that public health protection pays.

One of the serious shortcomings of municipal health protection is the inadequate budget with which the health officer is supplied to combat disease, and to build up the health of the community. Public health protection is a form of community insurance; and just as every form of insurance costs money, so public health protection also requires its financial allotment. As a rule, the larger the budget for public health protection, the more efficient and thorough is that protection. This is not always true however, since a large budget administered by an untrained and unscrupulous health officer will not yield the desired results. Not only is it necessary to have an adequate budget, but the control of that money must be left in the hands of experienced, trained, honest, and careful health officials.

Several years ago, the American Public Health Association estimated that adequate health protection for a community could be obtained with an appropriation of 50 cents per capita. This figure was based on the activities of a modern health department and on the costs of materials and labor that prevailed at that time. With the increase in wages, and the increase in the cost of materials, this figure must necessarily also be increased. Dr. W. H. Park, of the New York

City Health Department, in 1911, estimated that a community requires from 50 cents to one dollar per capita for adequate health protection. It is doubtful whether the upper limit of $1.00 per capita is frequently reached, but it is reasonable to expect that the lower limit of 50 cents per capita should be provided. When a city is large, a per capita appropriation of 50 cents, will enable it to do much more in the way of adequate health protection than a smaller community, with the same appropriation. In order to have modern and satisfactory health protection, smaller communities, especially those under 25,000 population, must provide a larger per capita appropriation than cities having populations of 50,000 and more. In some of the communities under 25,000 it may be necessary to provide an appropriation of approximately $1.00 per capita. Otherwise it will be impossible to attract trained and experienced health workers, or to conduct the manifold important activities of a modern health campaign.

CHART Q.
PER CAPITA EXPENDITURES FOR MUNICIPAL ACTIVITIES, 1915-1917.



Not only is it important to have an adequate appropriation for the health department, but it is equally as important to know that the money is being spent wisely, and in those directions where it will do most good. A health officer must therefore determine the relative value of the pressing public health problems in his community, and know which will lend themselves readily to control. With this knowledge, he can decide how his appropriation should be spent. In the following study of the budget, an attempt will be made to scrutinize the items of expense and to indicate whether the proper activities are being emphasized or not.

In studying the budgets for Oklahoma City it was only possible to obtain the list of expenses for 1915, 1916, and 1917. These however, are sufficient in order to show how much the city is spending for its various activities. The total amount of money spent by each department and the per capita expenditure for each department are shown in the following tables:

TABLE No. 52.

EXPENDITURES FOR VARIOUS MUNICIPAL ACTIVITIES

Department	1915	1916	1917
Street Department	$ 48,042.74	$ 48,836.32	$ 56,284.47
Sidewalk Department	2,521.66	2,310.06	1,308.10
Street Lighting	33,805.63	37,564.19	33,146.67
Engineering and Sewer Department	14,441.27	16,810.82	20,138.38
Building Inspection Department	4,174.36	3,857.66	4,443.31
Park Department	19,556.85	19,976.36	27,556.22
Water Department	116,858.85	123,157.82	187,610.81
Carnegie Library	6,724.22	6,619.85	6,960.09
Inspection of Weights and Measures	1,269.99	1,263.25	1,350.10
*Police Department	76,479.19	77,377.19	76,439.07
*Fire Department	94,045.97	103,880.88	99,136.48
Health and City Chemist Departments	18,216.16	16,642.53	19,728.35
Garbage Department	22,688.52	23,938.80	22,292.36
Detention Hospital	8,918,05	7,606.56	8,002.76
Maternity Home	1,445.16	1,641.26	1,876.62
Public School Education	340,277.00	352,477.00	390,755.00

*Includes cost of maintaining alarm system.

TABLE No. 53.

PER CAPITA EXPENDITURES FOR MUNICIPAL ACTIVITIES IN OKLAHOMA CITY

Department	1915	1916	1917
Street Department	$0.54	$0.53	$0.57
Engineering and Sewer Department	0.16	0.18	0.21
Building Inspection Department	0.05	0.04	0.05
Detention Hospital	0.10	0.08	0.08
Park Department	0.22	0.22	0.28
Water Department	1.32	1.33	1.92
Sidewalk Department	0.03	0.02	0.01
Carnegie Library	0.08	0.07	0.07
Garbage Department	0.26	0.26	0.23
Health Department	0.21	0.18	0.20
Maternity Home	0.016	0.018	0.019
Street Lighting	0.38	0.40	0.34
Inspection of Weights and Measures	0.014	0.014	0.14
Police Department and Alarm System	0.86	0.83	0.78
Fire Department and Alarm System	1.16	1.12	1.01
Public School Education	3,89	3.80	4.00

With the aid of these two tables it will be possible to determine not only the relative amounts of money expended for each activity but also the relative per capita expenditure for each activity. From a practical standpoint, the latter is very important.

Major municipal activities include education, health protection, protection from fire, police protection, water supply, disposal of wastes, including sewage and refuse, and the care of the streets. If the expenditures for these major municipal activities be studied, it will be observed that the amounts spent for maintaining streets, for police protection, for fire protection, and for water supplies are approximately from 2.5 to 7 times as great as the amount spent for the protection of the public health. Nor is this all. Further study will show that the city is spending more money for maintaining the parks than it is for protecting the public health. Twice as much is being spent for lighting the streets than for the prevention of disease, and more money is being spent in maintaining the present unsatisfactory garbage system than for the prevention of disease.

The following table gives the itemized expenses for the health department.

TABLE No. 54.
ITEMIZED EXPENSES OF THE HEALTH DEPARTMENT

Item	1915	1916	1917
Salaries, General	$4,779.52	$5,847.50	$7,155.15
Salary Sanitary Inspector	2,927.50	1,860.00	2,072·00
Chemicals and Appliances	299,88	299.60	434.43
Stationery, Printing, Postage	108.81	148.65	143.55
Care of Patients at Hospital	5,465.46	4,378.82	5,229.03
Auo Expenses	587.50	------	1,505.62
Cutting Weeds	2,266·55	1,198.22	1,332.91
Other Expenses	298.82	999.79	230.37
Salaries, City Chemist Department	1,200.00	1,241.00	1,266.00
Supplies, City Chemist Department	231.07	564.36	300.41
Other Expenses, Chemist Department	51.05	105.59	58.88
TOTAL	$18,216·16	$16,642.53	$19,728.35

It is well to examine the individual items of expense for the health department in order to determine whether that money is being spent for modern, recognized methods for preventing disease. On doing so, it will be found that two of the largest items are for the care of patients at hospitals and for cutting weeds. Although the treatment of the sick poor is important, and should be extended, it is true that the appropriation for such work should not be charged up to the health department as part of the appropriation for preventing disease. A special and separate appropriation must be available to cure disease. Although the cutting of weeds is desirable, not only because weeds serve to protect mosquitoes during the day time, but because they also prove very obnoxious to hay fever patients, it is believed that the work should be done at the expense of the land owner and not at the expense of the city.

While the education of the child is one of the most important functions of the municipality, and rightfully deserves the splendid support which American communities give, yet it is probably doubtful whether education is worth twenty times as much as the health of the community. From the appropriations for health activities and public school education, it will be observed that twenty times as much money is spent for public school education as for health protection. The ratio of the value of these two activities does not seem to be justifiable. A larger appropriation for health protection is necessary. Part of this money would undoubtedly go to the greater protection of the health of the children in the schools. The best education will be wasted if the children are not maintained in good health. Health and education must go hand in hand in order to yield the greatest returns to the child, the community, the state, and the nation.

It will also be observed from the table that the amount spent for sanitary inspection is very small, particularly for a city as large as Oklahoma City. It is impossible to obtain for $2000.00, adequate or satisfactory inspection of dairies, food stores, milk stations, restaurants, open privies, unsafe wells, garbage nuisances, mosquito breeding places, poor housing conditions, and other factors that usually come within the scope of the activities of a sanitary inspector. It will be necessary to increase the appropriation for this work, as outlined under the plan for the reorganization of the health department.

Not only has it been shown that the money available for preventing disease is not wisely spent, but it is also true that the per capita appropriation for protecting the public health is only two-fifths of the minimum amount of money which should be appropriated for health work. It will be the duty of the city, therefore, not only to appropriate sufficient funds to protect the public health, but also to place this increased fund in the hands of a trained, experienced, and intelligent health officer.

It is interesting also to observe from table No. 53, that the appropriations for the Maternity Home and the Detention Hospital are on the average only $0.018 and $0.019 per capita respectively. These amounts are too small to operate either institution effectively.

In order to show how the funds of the Garbage Department are spent, table No. 55 was prepared, giving the cost for each item.

TABLE No. 55

ITEMIZED EXPENSES OF THE GARBAGE DEPARTMENT.

Item	1915	1916	1917
Salaries, Superintendent	$ 2,517,26	$ 2,040.00	$ 1,560.00
Repairs to Buildings	32.35	92.75	33.17
Wages, Drivers and Helpers	10,062·75	12,733.22	12,233.94
Repairs to Equipment	2,650.10	1,618.81	1,475.50
City Dump Expense	1,181.13	630.00	--------
Livestock Expense	5,146.75	5,418·22	5,840.66
Stationery, Printing, Postage	233.05	325.69	354.80
Motor Vehicle Expense	650.26	746.07	602.74
Other Expenses	208.87	334.04	191.55
Total	$22,688.52	$23,938.80	$22,292.36

Sufficient comment on the operation of the garbage department was made in the chapter dealing with refuse disposal. It is therefore, unnecessary to add any further remarks here.

In order to prove conclusively that Oklahoma City is not spending enough money for the protection of the public health, it is only necessary to compare the expenditures for this purpose, with the expenditures for the same purpose in other cities of the same size. The statistics which follow were obtained from the Financial Statistics of Cities as published by the U. S. Bureau of Census. In the two years 1916 and 1917, the latest years for which these reports were available, there were 64 cities in this country that had a population of 50,000 to 100,000. In 1916, 36 of the 64 cities or 56 per cent, were spending more per capita for the conservation of health, than Oklahoma City. In 1917, 39 of the 64, or 61 per cent, were spending more per capita for health conservation than Oklahoma City. The following are the important items which are included under health conservation: Health Department Administration, Vital Statistics, Prevention and Treatment of Communicable Diseases, Conservation of Child Life and Food Regulation and Inspection. These important matters pertaining to the public health are evidently neglected in Oklahoma City.

The following table gives a list of the cities that are spending more per capita for health conservation than Oklahoma City. The cities are all in the same population group, and it is obvious that they represent all parts of the country. The table gives the per capita expenditure for conserving health in each of these cities during 1916 and 1917.

CHART R.

PER CAPITA APPROPRIATION FOR HEALTH CONSERVATION, 1917, CITIES 50,000-100,000.

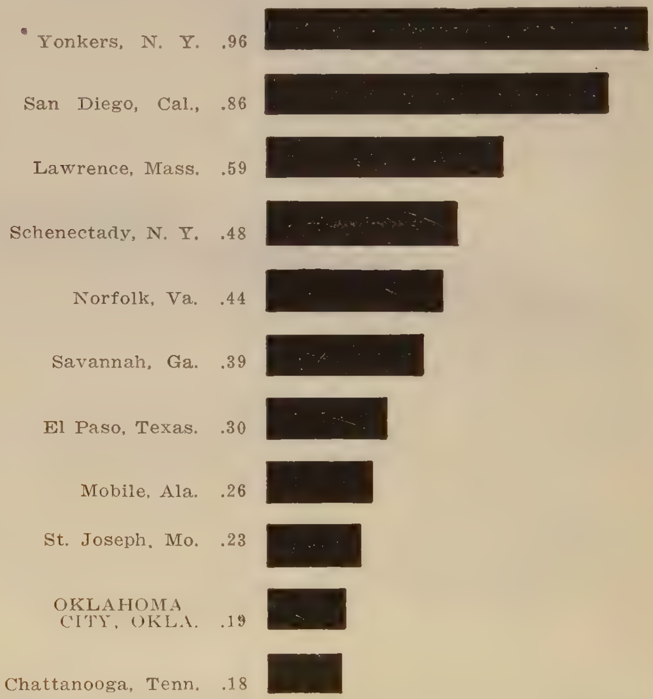


TABLE No. 56.

SOME CITIES HAVING POPULATIONS OF 50,000 TO 100,000 WHICH ARE SPENDING MORE PER CAPITA THAN OKLLAHOMA CITY FOR HEALTH CONSERVATION.

City	1916	1917
Lawrence, Mass.	0.54	0.59
Yonkers, N. Y.	0.88	0.96
Schenectady, N. Y.	0.30	0.48
Duluth, Minn.	0.37	0.35
Norfolk, Va.	0.37	0.44
Elizabeth, N. J.	0.31	0.38
Somerville, Mass.	0.51	0.47
Waterbury, Conn.	0.27	0.25
St. Joseph, Mo.	0.20	0.23
Utica, N. Y.	0.20	0.18
Troy, N. Y.	0.28	0.36
Manchester, N. H.	0.23	0.26
Hoboken, N. J.	0.27	0.30
Erie, Pa.	0.25	0.21
Jacksonville, Fla.	0.28	0.32
Passaic, N. J.	0.26	0.26
Savannah, Ga.	0.39	0.39
Brockton, Mass.	0.43	0.51
Sacramento, Cal.	0.38	0.33
Holyoke, Mass.	0.62	1.74
El Paso, Texas	0.30	0.30
Charleston, S. C.	0.31	0.29
Chattanooga, Tenn.	0.31	0.18
Mobile, Ala.	0.41	0.26
Atlantic City, N. Y.	0.33	0.52
New Britain, Conn.	0.33	0.32
San Diego, Cal.	0.81	0.86
Malden, Mass.	0.53	0.54
Oklahoma City, Okla.	**0.19**	**0.19**

Another instructive table is table number 57, which follows. It shows the relative expenditures in percent, for the different municipal departments in Oklahoma City.

Again it will be seen that the relative expenditure for health conservation is considerably less than for the other departments. Thus from four to six times as much money is being spent for police protection and protection from fire, and over twenty times as much is being spent on the public schools. Objection is not found so much with the amounts of money spent for the other activities, as with the relative insignificant role which the conservation of the public health plays in the municipal activities. Similar information is recorded in parallel columns for the two other large cities in the state. The same general faults will be seen to prevail in these other cities.

TABLE No. 57.

PER CENT DISTRIBUTION OF THE EXPENSES FOR THE GENERAL MUNICIPAL ACTIVITIES OF OKLAHOMA CITY, MUSKOGEE AND TULSA IN 1917.

	Oklahoma City	Muskogee	Tulsa
General Government			
Legislative	---	---	---
Executive	7.5	11.2	12.6
Judicial	0.3	0.3	0.3
Elections and Gen. Gov't Bldgs.	1.6	0.4	1.2
Protection to Person and Property			
Police Dep't	8.1	8.0	9.6
Fire Dep't	11.9	11.1	9.5
All other	0.8	0.3	1.3
Conservation of Health	2.1	0.8	2.6
Sanitation or Promotion of Cleanliness	6.3	2.4	3.6
Highways			
General Expense	8.5	9.8	7.6
Repair & Construction for Compensation	0.7	0.7	0.8
Charities, Hospitals & Corrections	2.4	5.0	2.5
Education			
Schools	45.4	42.1	39.7
Libraries	0.8	1.7	1.4
Recreation	3.2	4.8	5.3
Miscellaneous	0.05	0.05	0.05
General	0.2	1.3	2.0

Summary

An analysis of the city budgets for 1915 to 1917 shows that Oklahoma City is spending only eighteen to twenty-one cents per capita for the protection of the public health. When the appropriation is analyzed still further, it is found that the money is not being spent for those activities which will save lives and really protect the public health. It is estimated that a community should spend from fifty cents to one dollar per capita for the protection of the public health. Probably for a community as large as Oklahoma City the amount actually spent should approximate fifty cents per capita. It is found from comparisons with other cities of the same size that Oklahoma City is spending very much less for health conservation.

A comparison of the relative expenditures for the major municipal activities shows that 2.5 to 7 times as much money is being spent for the maintenance of streets, for police protection, for fire protection and for water supplies as is being spent for health protection. Twice as much money is being spent for street lighting as for health protection. More money is being spent for the care of the parks and for the garbage department than for health protection. For public school education, twenty times as much money is being spent, as for health protection.

Recommendations

1. That the budget for the protection of the public health be increased to at least fifty cents per capita, in accord with the plan of reorganization outlined for the city health department, and that this money be placed in charge of a well trained, experienced and reliable health officer.

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